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1146

United States  
Circuit Court of Appeals  
For the Ninth Circuit 1146

Transcript of Record

GEORGE J. HENRY, Jr.,  
*Complainant.*

vs.

CITY OF LOS ANGELES,  
*Defendant.*

VOLUME 7  
(Pages 2401 to 2872 Inclusive)

Upon Appeal from the United States District Court for  
the Southern District of California,  
Southern Division

FILED

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F. D. MONCKTON,  
CLERK







XQ. 860. In comparing the fly-balls shown in Complainant's Exhibit XXX with the dynamo 8 of Complainant's Exhibit A, I believe you used the word "analogous". Do you mean by that that you consider the dynamo and the fly-balls mechanical equivalents?

A. Yes, sir.

XQ. 861. Do you mean by "mechanical equivalents" an element or part which is analogous to the part of which it is said to be the equivalent?

A. Yes, but a mechanical equivalent is perhaps more than analogous; it is the equivalent of; in other words, it is the equal of, in its operation, and the result which is accomplished.

XQ. 862. You would not say that the dynamo 8 and the fly-balls referred to in the last preceding question were the same means for accomplishing the result, would you?

Mr. Blakeslee: Objected to as being a mere self-serving statement, the very definition in the question making it clear that they are not the same means, as there are not the same names given to them.

A. I would not say that physically they were absolutely the same, but I would say that in the entire system the dynamo 8 and its operation is equivalent to the fly-balls and their operation, both producing an absolutely equal result in the operation of the device.

XQ. 863. (By Mr. Westall:) Your measure of the word "equivalent", then, is the result accomplished, is it not?

A. No, it is more than that. Referring to the dynamo 8 and the fly-ball governor, I should say that the fly-

ball governor is the mechanical equivalent of the dynamo 8, because they both produce substantially the same result by substantially the same means, and in substantially the same manner, in connection with the contrivance or device as a whole.

XQ. 864. You have varied somewhat your former definition by stating that they accomplish the same result by the same means. Do you mean to say that a dynamo and fly-balls can be said to be the same means for accomplishing the result?

Mr. Blakeslee: I object to this question as directly misquoting the witness. He did not say they were the same means, but that they were substantially the same means, which is an entirely different thing.

Mr. Westall: Counsel for defendant objects to the attempted coaching of the witness.

Mr. Blakeslee: Let counsel, if he attempts to quote the witness, quote him accurately.

A. I wish to be understood as saying that in the particular contrivance as disclosed by the Lyndon patent, and as shown in Exhibit KKK by the fly-balls, there are substantially the same means of producing substantially the same result and substantially in the same manner, namely, by variation of speed.

XQ. 865. (By Mr. Westall:) Then it is correct to say baldly, is it, that a dynamo such as illustrated at 8 in complainant's exhibit A, and fly-balls such as shown in Complainant's Exhibit KKK, are substantially the same means?

A. They are substantially the same means in the contrivance in which each respectively operates, yes.



XQ. 866. You have also spoken of the line-to-line valve B of Complainant's Exhibit KKK, and the solenoid 33 with its core 34, as analogous to, or the equivalent of each other. Do you mean to say that this solenoid 33 and its core are the same means as this line-to-line valve B?

Mr. Blakeslee: Objected to as a further self-serving statement; counsel, having differentiated in his definition of the two things, cannot now ask that the witness testify that two dissimilar things in definition are exactly the same thing in fact.

The Witness: I mean to be understood as saying, as I have said in previous testimony some time ago, that the solenoid 33 of the Lyndon patent, and the device marked as "B" on complainant's exhibit KKK, produce substantially the same result in substantially the same manner by substantially the same means, when they are considered each, respectively, as a part of the complete contrivance for the regulation of the water wheel at constant speed with variation of speed, due to a variation of load or water pressure.

XQ. 867. (By Mr. Westall:) So that you wish to testify that a line-to-line valve and a solenoid are substantially the same means?

A. I do not, and I did not say so. I said this: that in the respective contrivances as set forth in the Lyndon patent and on Exhibit KKK, the solenoid 33, and the parts immediately connected therewith produce substantially the same result as the valve B, in substantially the same manner, by substantially the same means. I did not wish, however, to be understood as saying that a



solenoid and a valve are the same means, dissociated each from the complete device as set forth in the Lyndon patent, and upon Complainant's Exhibit KKK.

XQ. 868. (By Mr. Westall:) Isn't it, then, a little inaccurate to say that they accomplish the same result by substantially the same means?

A. No, sir, it is not; it is absolutely accurate,, because it is the fact.

XQ. 869. What means do you mean that they accomplish this result by?

A. I wish to be understood as saying that the means by which they operate in conjunction with the entire contrivance is the same, as far as the result obtained and the manner in which that result is obtained.

XQ. 870. But, considered separately from the patent and from complainant's exhibit KKK, you do not consider a solenoid and a line-to-line valve the same means, do you?

A. Of course, I do not, otherwise I would have said so.

XQ. 871. And considered apart from "Complainant's Exhibit A" and "Complainant's Exhibit KKK," you do not consider a dynamo and fly-balls as substantially identical as means, do you?

A. I will repeat my former answer, in the same words.

XQ. 872. Do you say, then, that a water wheel governor by which the inverse action of a water-wheel gate and by-pass valve is affected by a dynamo and certain magnets and electrical circuits, is identical, as to means, with a mechanical device in which no dynamo, no electrical circuit and no magnet are used?

A. No, and I beg most respectfully to protest against your introducing words that I do not use. I have not used the word "identical" or "identically" at all. If you frame your question as I have framed my answer I can answer it satisfactorily, I think.

XQ. 873. You may put your answer in any form you wish in answering the question; choose your own words. I only ask you whether you would say that.

A. I would not consider two things so different as those you have attempted to make equal, as identical, of course, nor would any other person.

XQ. 874. Would you consider the combination of the dynamo, the electrical circuit, solenoid, magnets, springs, to be substantially or nearly identical, as means, with a mechanical device containing no electrical features whatever?

A. I, of course, would not consider them identical, nor would anybody else.

Mr. Westall: I used the words "substantially".

The Witness: Pardon me, you did not.

(The reporter reads the last question.)

The Witness: I object to the word "identically" or "identical".

Mr. Westall: I ask that the question be answered.

Mr. Blakeslee: We object to this purposeless inquiry, which is a mere quibble on terms, and in which counsel is apparently trying to force the witness to employ terms which he, himself, utters, and as between which and the terms chosen by the witness, the witness has already repeatedly differentiated.

Mr. Westall: The witness has used the word "analogy" and the word "analogous", and he has used

the word "mechanical equivalent", and the word "substantially".

The Witness: The witness has not used the words "identical" or "identically" at all.

Mr. Westall: These questions are intended to have the witness define what he has meant in making his comparisons of these different elements.

(The reporter reads the last question.)

Mr. Westall: I will ask that the witness answer the question as it has been read.

The Witness: I have answered the question.

XQ. 875. Would you refer to a combination of dynamo, electrical circuit, solenoids and magnets, shown and illustrated in complainant's Exhibit A, as substantially the same means for accomplishing inverse action of the by-pass valve and the water wheel gate as are used in Complainant's Exhibit KKK?

Mr. Blakeslee: Objected to as incomplete, inasmuch as the disclosure of "Complainant's Exhibit A" is not a combination of solenoids, circuit, dynamo, etc., but is clearly a combination of these and purely mechanical means.

A. I would answer that question yes, when we take into consideration the entire disclosures of the Lyndon patent, and the mechanism as illustrated on blueprint KKK.

XQ. 876. (By Mr. Westall:) Whether, then, you would consider a dynamo and fly-balls substantially the same means would depend upon the device in which you found those elements, would it not?

A. Certainly.

XQ. 877. And whether or not you considered rods



connecting the various parts as the equivalent of an electrical circuit would depend upon the structure in which you found those rods?

A. Not only depend upon the structure, but the way in which the entire structure or combination of parts was operated and utilized.

XQ. 878. Claim 3, to which reference was made on your direct examination, calls for a clutch connection, and claim 4 calls for a reversing clutch gear. You have stated that in Complainant's Exhibit KKK you find all the elements of each of the two claims referred to. Will you please point out this clutch and clutch gear in the exhibit referred to?

A. I will be glad to do so if you produce my previous testimony in this case.

XQ. 879. Do you mean to say that you cannot point out this clutch and clutch gear without a reference to your previous testimony?

A. No, sir, I do not, but because in my previous testimony I have answered exactly that question.

XQ. 880. But you were asked again upon your direct examination on rebuttal whether or not you found the subject matter of those claims in complainant's exhibit KKK, and you stated that you did. I am now asking you to point out the particular elements referred to.

A. I have replied to you that I would be glad to do so if you will refer to my previous testimony in this case.

MR. WESTALL: I ask that the witness answer the question.

THE WITNESS: I am perfectly willing to answer any question that counsel may ask, but in replying I

can only repeat my previous answer. He can get the answer to that question which I have already answered.

MR. WESTALL: Counsel for defendant suggests that the refusal of the witness to point out the alleged equivalent of the element called for is open to the construction that he cannot safely do so without a reference to his previous testimony; and in order that this implication may not now have any weight, we urge upon the witness and upon counsel for complainant the necessity of answering the question.

THE WITNESS: The witness does not desire to have it understood that he refuses to answer any proper and legitimate question of counsel; but inasmuch as this was entirely gone into completely and in every detail in the previous examination, I simply refer counsel to my answer in that case.

MR. BLAKESLEE: We call attention to the fact that the witness went fully and carefully into such comparison in his testimony in the *prima facie* case, and that the question put to him in rebuttal, and to which counsel apparently refers, was merely a question as to whether he found the subject, taken as a unit, of several of the claims present in the defendant's structures. We object to the witness being forced to go in detail over the same ground he has fully gone over before, as will be found in the record if counsel will look for it.

MR. WESTALL: Counsel for defendant suggests that if the matter had been fully gone over, as suggested by counsel for complainant, there seems to be no reason why the question should have been asked on rebuttal; but having been asked, it now becomes proper for counsel for defendant to cross-examine.

MR. BLAKESLEE: Counsel fails still to appreciate the fact that the question on rebuttal was as to the subject of claim 3, and the subject of Claim 4, taken each as a unit, and no question was asked him on rebuttal as to the subject of these claims in piecemeal. Those questions were asked this witness, and I believe they were asked by counsel for defendant, in extenso in the opening case, and any mere repetition of that testimony, for that reason would not be proper rebuttal.

MR. WESTALL: Counsel for defendant is particularly anxious to have the witness answer this question, because he believes that if the witness attempts to point out the clutch gear as he did on direct examination, he may have some difficulty in finding the same clutch gear at this time.

MR. BLAKESLEE: Counsel now admits that the witness has answered the question, which is all the reply that is necessary.

THE WITNESS: The witness can only say, that if counsel wishes, the witness will proceed at once to carry out every analogy between the two patents.

MR. WESTALL: Counsel for defendant did not ask witness to completely carry out analogies, but merely to answer a very simple question.

THE WITNESS: The witness has no other interpretation than that this question of counsel is nothing more nor less than to ask him to repeat all his previous testimony, which witness considers is not perhaps necessary, although I will answer any question which counsel chooses to ask in good faith.

MR. BLAKESLEE: The record speaks for itself. The witness has manifestly answered this question once.



MR. WESTALL: The question is repeated, and the witness is asked to answer it.

THE WITNESS: Will you please read the original question?

MR. BLAKESLEE: We will have again to have recourse to notifying defendant that the cost of taking and returning such repetitious portions of the record will be moved to be taxed against defendant in all events in this case.

(The reporter reads XQ. 878, page 2131, beginning on line 19 thereof.)

THE WITNESS: Will counsel please refer to the exact clutch gear in Claim 3 that he desires the answer to?

(At request of counsel for defendant the reporter again read question 878.)

A. In Claim 3 on page 5, line 16, and somewhat in advance of that, you will find this statement, "a returning device for said controller provided with a clutch connection to said operating shaft."

Again, on page 5, Claim 4, lines 25 to 30, we find these words: "In a water-wheel governor, the combination "with a water-gate operating shaft, a driving shaft and "reversing clutch-gear, adapted to turn the water-gate-"operating shaft in either direction."

I wish to answer counsel's question as follows: that the clutch connection to said operating shaft of Claim 3, and the "reversing clutch-gear of claim 4, both adapted to turn the water-gate-operating shaft in either direction, is represented by the equivalent on blueprint KKK of the piston cylinder marked "A"; the piston being so arranged that it may operate in either direction, and there-

by operate the water-gate-operating shaft in either direction, as set forth in Claim 4, and corresponding with the clutch connection to said operating shaft in Claim 3.

XQ. 881. Now, do you include in the cylinder and piston pointed out, the casing and the piston rod and the means within the cylinder for moving the piston, as part of the elements referred to in Claims 3 and 4?

A. Yes, sir.

XQ. 882. Do you consider such a cylinder with fluid pressure therein, with its casing, piston and piston rod, as substantially the same means for accomplishing its result as the clutch-gear and clutch connection described in said Claims 3 and 4?

A. Yes, I do, when the clutch connection to said operating shaft in Claim 3 and the driving shaft and reversing clutch gear referred to in Claim for, are taken in connection with the entire contrivance to produce the result desired.

XQ. 883. But, in determining whether said elements are substantially the same means, you consider the result to be accomplished and the method in which that result is accomplished?

A. Yes, sir.

MR. WESTALL: That is the end of my cross-examination.

#### REDIRECT EXAMINATION.

July 10, 1915. A.M.

RDQ. 884. On your cross-examination you have testified, with respect to the showing of Defendant's Exhibit Berry Blueprint No. 1, that the disclosure thereof, assuming it could operate at all, might be considered in

some sense or other to be a water-wheel governor. Will you please state whether, under the most favorable conditions, and assuming that such apparatus, in part and in whole, were operative, it could operate as and perform the functions of a speed-sensitive governor to maintain constant water-wheel speed?

MR. WESTALL: Objected to as being merely repetitious, having been already fully answered by the witness, and not being properly redirect examination.

A. No, sir, it could not under any conditions be utilized as a governor for the regulation of the speed of the water-wheel constant with varying load.

RDQ. 885. (By MR. BLAKESLEE:) Can you give any one leading or particular reason to support your last answer?

A. The fundamental reason is, in the first place, that the connection whereby power is transmitted from the water wheel to the generator, in other words, the way in which the power is transmitted from the shaft of the water-wheel to the shaft of the generator, is through the so-called speed sensitive device, which is, in reality, nothing more than the ordinary type of power-transmission dynamometer; in other words, all the power which is transmitted from the water-wheel shaft to the generator shaft is transmitted through the so-called speed-sensitive device. Under absolutely no conditions is it ever possible to use the same device, and particularly the device which contains fly-balls that are affected by speed, to at the same time act as a part of the mechanism to transmit the power from one shaft to another. In other words, the mere fact that the power-transmission dynamometer in this case, which was presumed to have been a governor



for the purpose of maintaining the speed of the water-wheel constant under all loads of the generator, is used as a means of transmitting the power between the water-wheel shaft and the generator, precludes it from being a speed-sensitive device.

RDQ. 886. And what, again, is the particular part or element, or parts or elements of this dynamometer which was, apparently, or were apparently intended to serve as such directly speed-sensitive parts analogous to the fly-balls you have mentioned in other governors?

A. As shown in figure 1 of Berry Blueprint No. 1, the speed-sensitive elements are the fly-balls 3, 3 mounted on the lever arms, 2, 2, pivoted at the point 4, 4. A change of speed alone would tend to change the position of the fly-balls 3, 3, but this change of position of the fly-balls 3, 3, is immediately affected by the links 6, 6 connected with the crank 7, keyed to the shaft, 8. In other words, while the variation of speed will tend to affect the position of the fly-balls 3, 3, the amount of power transmitted will interfere with the motion of these fly-balls, as far as a change of speed affects them, by the transmission of power through the links 6, 6, crank shaft 7, to shaft 8. Again, the spiral springs 5, 5, are presumed to retard, if it were a speed device only, the motion of the fly-balls 3, 3; but as a matter of fact the tension of these spiral springs 5, 5 is not the only thing retarding the change in the position of the fly-balls 3, 3, but in addition, as I have said, the pull upon the links 6, 6, because the device is transmitting power.

RDQ. 887. Can it properly be said in any respect that apparatus or mechanism constructed to embody the

disclosures of Defendant's Exhibit Berry Blueprint No. 1, even if entirely operative, could constitute a water-wheel governor such as that disclosed in and contemplated by the disclosure of complainant's exhibit A, copy of Lyndon Patent in suit?

A. No, sir, it could not under any conditions.

RDQ. 888. And could such embodiment in any sense accomplish the results of the invention disclosed in said complainant's exhibit A?

A. It could not.

RDQ. 889. What have you to say, in similar comparison between such embodiment of the disclosures of Berry Patent No. 1 <sup>and</sup> the defendant's alleged infringing structures as exemplified, for instance, in complainant's exhibit KKK?

A. It could not—or, to be more definite, the disclosure, as set forth in figure 1 of Berry Blueprint No. 1 patent, could not, under any conditions, perform the same functions or give the same result, so far as the control of constant speed, as the governing mechanism disclosed on Complainant's Exhibit KKK.

RDQ. 890. You have referred to your familiarity of long standing with a power weighing or measuring device known as a dynamometer similar in general organization to the subject of figure 1 of Defendant's Exhibit Berry Blueprint No. 1. Will you please state for what such device or mechanism has been and is used?

A. Such a mechanism has been for many years, and is, used for the purpose of measuring the amount of power transmitted from a driving shaft such as the water-wheel in this case, to the driven shaft, such as the

shaft of a generator in this case. This measuring is accomplished very readily, and only requires observation of two quantities—one, the number of revolutions per minute; two, the displacement or relative twisting between the two shafts, this twisting being controlled by the fly-balls 3, which are thrown out as a result of the revolution of the fly-wheel itself, and the balancing of this by, first, the tension on the spiral springs 5, 5, 5, and the pull or torque, or pull required to turn a driven shaft, transmitted through the links 6, 6 and the crank 7. In other words, the device is used and has been used exclusively for the measurement of power transmitted, and its especial use has been to determine the efficiency of the prime mover, which, in this case, is the water-wheel, giving the amount of power delivered from it to the generator shaft, and also to determine the efficiency of the driven device—in this case a generator, since, if we know the power put into the generator shaft, and the amount of power delivered from the generator terminals, we can get the efficiency of the generator separate from the combined efficiency of the water-wheel and generator. In other words, the device shown in figure 1 of Berry Blueprint No. 1 is a power-transmission dynamometer, or a device to measure the power transmitted through it from a driving shaft to a driven shaft—as I have said, especially used for the determination of efficiency of prime movers separately from the driven device such as the generator.

RDQ. 891. Is it customary, after such power measurement or weighing has been performed, to leave such dynamometer device installed or interposed between the drive part and the driven part?



A. No, sir, it is not, as usually, the transmission dynamometer, which allows a relative twist when in operation, between the water wheel shaft and the shaft on the generator, is replaced by a rigid coupling, so that the shaft driving them and the driven shaft, are rigidly connected together, so that they are not relatively twisted as the power is transmitted from the one to the other.

RDQ. 892. And then, so far as the governing of the installation in accordance with Berry Blueprint No. 1 was concerned, what effect would have been produced had the dynamometer device of figure 1 of Berry Blueprint No. 1 been converted into a rigid coupling, after the measuring or weighing performance had been completed—considering now the attempted governing of this installation for the purpose of maintaining constant water wheel speed?

A. The replacement of the power transmission dynamometer, by a rigid coupling would have prevented any motion having been transmitted through the link 17 to the cylinder and piston controlling the gate valve, and the gate valve would, under no circumstances, have been moved at all. As it was, however, leaving the power transmission dynamometer in, the gate valve was either operated, or the tendency was to rotate it as a result of the change in the amount of power transmitted, and not as a result of variation of speed.

RDQ. 893. My last question concerns solely the substitution of such rigid coupling for such dynamometer device, and what the effect produced would have been upon the attempted operation of this installation, considering the governing of the water-wheel to maintain constant speed?

A. There would have been no result whatsoever, and the speed would have fluctuated directly in proportion to the change of load, or the change of pressure. The movement of the by-pass valve would have been zero under every condition, because, when the power transmission dynamometer was installed, the movement of that by-pass valve was merely proportional to the relative twist between the two shafts, which twist is proportional to the power transmitted between the two shafts; and if there was a solid coupling, there would have been no relative twist, and no motion transmitted to the by-pass valve whatsoever, and therefore, no governing whatsoever.

RDQ. 894. But so far as maintaining constant speed of the water-wheel was concerned, would there have been a sacrifice of anything assuring the maintenance of constant speed of the water-wheel, had such rigid coupling been substituted for the dynamometer device?

A. No, there would have been no sacrifice whatsoever; in other words, the regulation for constant speed would have been just as satisfactory with a solid rigid coupling replacing the power-transmission dynamometer as when the power-propelling transmission dynamometer was used to transmit the power between the water-wheel shaft and the generator.

RDQ. 895. You have discussed Berry Blueprint No. 1 with respect to the absence from the showing thereof, of a returning device to prevent overrunning of the governor—assuming there were any governor at all disclosed in such blue-print within the meaning of the Lyndon patent in suit. Irrespective of whether the by-pass

valve were coupled up with the water-wheel-gate-operating means in such manner as always to operate inversely thereto. Will you please state whether or not such returning device is present in such disclosure, and if not, why not?

A. Such returning device is not present in the disclosure of the Berry Blueprint No. 1. By that I mean that there is no returning device which brings the returning device to its mid-position at the normal speed. It is true that the returning device is returned to what might be called the midway or normal position, but under no conditions can we say that this position is accomplished at the right speed. It may be accomplished at any speed at which the water-wheel and generator may finally settle down to, which is absolutely different from the returning device as disclosed in the Lyndon patent, wherein, under all circumstances, the controlling device is returned to its seat or normal position only at the proper speed.

RDQ. 896. And therefore, in the use of the embodiment of Berry Blueprint No. 1—assuming it operative—what would result in the action of the alleged governor in an attempted correction of water-wheel speed?

A. It would not be corrected for any fixed and definite speed. We would find that the water-wheel and the generator driven thereby would, at different times be operated at very many different speeds, these various speeds being steady for the time, depending upon the load upon the generator and the pressure in the pipeline.

RDQ. 897. And what would you find with respect



to the hunting, or surging, or overrunning of the speed?

A. You would find that prior to the settling down of the speed of the water wheel under any given conditions to some number of revolutions per minute, there would be hunting or see-sawing until the temporary speed finally became reasonably constant.

RDQ. 898. Is that possible in the operation of the disclosure of Complainant's Exhibit A, or the disclosure of Complainant's Exhibit KKK?

A. No, sir, it is not possible, because the returning device is gradually brought to its midway, or normal position only, and absolutely only, at some predetermined, fixed normal speed.

RDQ. 899. Then, within the sense of complainant's Exhibit A, is it proper or not to state that the disclosure of Berry Blueprint No. 1 includes a returning device to prevent overrunning of the governor?

A. No, sir, it is not.

RDQ. 900. I call your attention now to clause 3rd, on page 5 of "Defendant's Exhibit Cobb Efficiency Reporter," which reads as follows: "That their water-wheel governor as constructed and applied was a transmission dynamometer giving accurate measurement of the power passing through it to the generator shaft." Is that statement correct, or in accordance with your understanding of the purpose and function in the disclosure of Berry Blueprint No. 1, with respect to the dynamometer device shown in figure 1, particularly?

A. It is correct, and absolutely corresponds with my understanding of the device.

RDQ. 901. I call your attention again to Complain-

ant's Exhibit KKK, and to Complainant's Exhibit A, and wish you to recall to your mind your testimony in which you pointed out in Exhibit KKK, matter which you stated to be related to certain elements specified in claims 3 and 4 of "Complainant's Exhibit A", and will ask you what, in so pointing out, you understood to be the relation, if any, implied between the clutch connection specified in Claim 3, and the reversing clutch gear specified in Claim 4?

A. My understanding of the question as it was put to me was that they referred to the ~~same~~<sup>same</sup> thing and were identical.

RDQ. 902. As a matter of fact, in accordance with your own understanding of these claims, are these elements identical?

A. They are not; they refer to two different devices.

RDQ. 903. Now, will you please point out wherein, in "Complainant's Exhibit KKK," you find the clutch connection with which the returning device is provided as specified in Claim 3?

A. In Claim 3 I understand that the clutch connection contained within the phrase on line 15, page 5, "A "returning device for said controller provided with a "clutch connection to said operating shaft," refers, first, in the Lyndon patent to the disks 22 and 23 mounted on the operating shaft 12, which corresponds in the Complainant's Exhibit KKK, to the clutch connection E, with its component parts.

RDQ. 904. Please now point out wherein, in Exhibit KKK, you find the reversing clutch gear specified in Claim 4 of Complainant's Exhibit A?

A. Referring to Complainant's Exhibit A, line 27, page 5, where we find the words "Reversing clutch gear" in the portion of the sentence reading "a driving-shaft and reversing clutch-gear, adapted to turn the water-gate-operating shaft in either direction," is set forth in the Lyndon patent at figure 1 by the beveled gears 9, 10 and 11, and corresponds, as I previously testified, to the cylinder, including the piston and material contained within the cylinder, on Complainant's Exhibit KKK, marked A.

RDQ. 905. Referring again to Complainant's Exhibit Wilson Sketch A as suggesting forms and arrangements of needle valves and the nozzles therefor, will you please state to me whether or not it is practise, or can be practised, in using such devices, to so form and mass the material of the heads of such needle valves as to produce an absolute balance thereof when in seated position?

A. Yes, it is common practise to construct the needles in that manner.

RDQ. 906. Under such circumstances is there any difference or distinction between the balanced conditions of such needles when on their seats, and the balanced conditions of butterfly valves when on their seats?

A. There is none whatsoever, inasmuch as both valves, when being operated, merely leave their seats and do not slide or are drawn over or across their seats at all.

RDQ. 907. Is it just as easy, or is it not just as easy to start them both away from their seats as it is to continue movement thereof away from their seats?



MR. WESTALL: Objected to as having been already thoroughly answered.

A. Yes, sir, there is no greater force required to move them from a stationary position than to move them further after they have once been put into motion and are actually moving.

RDQ. 908. (By MR. BLAKESLEE:) And in the use of such a needle valve with its head-mass so proportioned or disposed, is the use of any springs necessary to assist in initiating the unseating movement of the valve?

A. In my experience it is not necessary, although it is very often used and under some conditions is desirable.

RDQ. 909. You have referred to the possible continuous formation of the seat of a butterfly valve. How is such seat formed to accommodate the movement of the two wings of the butterfly valve away from the seat in opposite directions?

A. The seat is formed so that it will be on one side of the valve in one-half of its part, and on the other side of the valve in the other half of its part, so that the butterfly valve in opening can be moved in only one direction, and similarly, in coming to a closed position will be rotated or moved in only one direction.

RDQ. 910. Are there any actual means of adjustment disclosed in Defendant's Exhibit Berry Blueprint No. 1 by the use of which the normal position of the alleged by-pass valve 41 may be changed or shifted?

A. No, sir, there is not.

RDQ. 911. You have referred to the presence of

certain means in the disclosure of Berry Blueprint No. 1. Do you find therein disclosed any means pertinent in any respect to a system of governing, which are operative for that purpose — keeping in mind particularly your testimony with respect to the breaking action of the alleged by-pass valve 41 in its rubbing engagement with its case?

A. The question is not clear to me.

RDQ. 912. In other words, are you willing to testify that any such alleged governing system or means embodying such system is an operative system or means—keeping in mind what I have called to your attention?

A. No, in my opinion there is not disclosed any operative means of governing for constant speed as set forth on Berry Blueprint No. 1.

RDQ. 913. Have you ever heard of a plug-cock or stop-cock valve, the body of which was not in contact with its case or seat?

MR. WESTALL: Objected to as having been already answered, and as being repetitious.

A. I have never heard of one unless it was taken apart.

RDQ. 914. (By MR. BLAKESLEE:) Is there anything disclosed in Berry Blueprint No. 1 to show or indicate in any way that the alleged by-pass valve 41 is not a plug-cock or stop-cock valve in intimate contact with its seat?

A. There is nothing to show that it is not, and the drawing very clearly shows that the cylindrical plug-cock is in contact with the cylindrical casing or seat of the valve.

RDQ. 915. Referring to Defendant's Exhibit Lamb Patent, does the disclosure thereof embrace anything in the nature of a returning device to prevent over-running of any governor therein suggested?

A. No, sir, there is no device whatsoever to prevent overrunning.

RDQ. 916. Within your personal knowledge can you testify as to any inefficiency of the water-wheels themselves of the installation of the Power Development Company which it has been alleged was, at least in part, in accordance with the disclosure of Berry Blueprint No. 1 before you?

MR. WESTALL: Objected to as being incompetent, irrelevant and immaterial, any question of the efficiency of the water-wheels not being pertinent to any issue in this case; and also on the ground that this is not proper rebuttal, nor proper redirect examination.

A. Of my personal knowledge I know the efficiency of the water-wheels was first questioned, and then experiments were made to determine what their efficiency was, and that a transmission dynamometer was installed for that purpose at that plant, and used.

RDQ. 917. (By MR. BLAKESLEE:) Did that knowledge come to you through any test in which you participated, or any observation you made of such wheels, or test of such wheels? In other words, did it come to you through any direct participation of yourself in any professional work, or in any capacity?

MR. WESTALL: The same objection.

A. No, it did not come to me in any work whatsoever that I did, personally.



RDQ. 918. (By MR. BLAKESLEE:) Nor in any observation of yours?

A. It came to me as the result of my visiting the plant some fifteen years ago.

RDQ. 919. And that was after the first wheels of that plant had been operated and their use discontinued?

A. I don't know that, one way or the other.

RDQ. 920. Is there anything in the disclosure of Berry Blueprint No. 1 which indicates whether or not the parts shown at 41 and 42, in figure 2 are not in fact a stuffing-box, or the like, rather than an actual bearing for any part or adjunct of the alleged by-pass valve?

A. There is not.

RDQ. 921. And is there anything in the disclosure of any part of such blueprint which makes it clear that there is not such a stuffing box or the like, provided for the connection from which extends the crank 49, shown in figure 4 of this blueprint?

A. There is nothing shown on the blueprint to distinguish as between a bearing and a stuffing box.

RDQ. 922. Referring to Complainant's Exhibit A, Copy of Lyndon Patent in Suit, will you please look at the part marked 48 in figure 1, and also read the paragraph beginning on line 99, page 4, and then state whether there is any doubt as to the type and nature of the by-pass valve disclosed in this patent; and if so, state why?

A. There is no doubt but what the type of by-pass valve as indicated in the perspective drawing, figure 1, wherein the by-pass valve is indicated by the number 48, and designated by the number 48, and by the paragraph beginning on line 99 of page 4, "When the governing is

“completed, the controlling-solenoid allows the lever 26  
“to return to normal position, the circuit of the compen-  
“sating magnet is broken by the return of rod 36 and  
“lever 43, and the butterfly-valve returns slowly under  
“the influence of its weight 70 to normal position,”—but  
that the by-pass valve was of the butterfly type.

RDQ. 923. You have been questioned to determine whether or not the alleged by-pass valve 41 of Berry Blueprint No. 1 might not be filed down and then caused to work. Assuming it were so filed down and put back into its case and subjected to the water pressure which would bear upon the same in accordance with the disclosure of this blueprint, what have you to say as to the results to be expected in an endeavor to turn the valve in its case?

A. The result to be expected would be that it might turn for a short interval of time, but very soon friction would develop again unless it were filed down so much as to prevent the rotating plug-cock from touching the casing, in which case it would not be an operative valve at all, and therefore, would not work, even under those conditions.

RDQ. 924. In other words, is it or is it not proper to state that if the plug-cock valve has a proper contact with its case to make it a water-tight valve at all, that under conditions of pressure such as would attach to the use or attempted use of the apparatus shown in Berry Blueprint No. 1, there would be a frictional contact of the valve in its case which would render rotation of the valve practically impossible under control of any sort of a governing system, or under any practical conditions?

A. It is proper to state that if the conditions outlined in your question are carried out, it would practically, and in general use be absolutely inoperative and unsatisfactory as a by-pass valve.

MR. BLAKESLEE: That is all.

RE-CROSS EXAMINATION.

RXQ. 925. (By MR. WESTALL:) In correcting your testimony given yesterday afternoon with regard to the clutch connection and clutch-gear mentioned in Claims 3 and 4 respectively, of Complainant's Exhibit A, and in comparing those elements again with the devices illustrated in Complainant's Exhibit KKK, I notice that you used the word "corresponds" or "correspond" in describing the similarity between the elements referred to of Complainant's Exhibit A, and the elements of Complainant's Exhibit KKK. Do you mean to say that the parts marked "E" upon said "Complainant's Exhibit KKK" are the mechanical equivalent of the disk 22 and 23 mounted on the operating shaft 12 of Complainant's Exhibit A which you have pointed out?

A. Yes, sir, I desire to be so understood.

RXQ. 926. Have you examined your previous testimony given with regard to equivalents—by which I mean the testimony given upon your direct examination some months ago?

A. No, sir.

RXQ. 927. Before having testified this morning?

A. I have never seen that testimony in written form.

RXQ. 928. Did you examine any of the marked ex-



hibits in this case, in which the elements were marked out, before correcting your testimony?

A. No, sir, I did not, except the exhibit KKK and Exhibit A of the Lyndon patent, because I understood in your question that you stated that you were referring to a single element spoken of in both claims, whereupon, upon giving it the consideration which I did not give it upon the instant, I presume—I don't know—I presume you were referring to two different elements, one being referred to in Claim 3, and an entirely different element being referred to in Claim 4, and my answer was that it was referred to in Claim 4, as previously given.

RXQ. 929. You were told, of course, in a general way the substance of what you had previously testified, and the mistake you had made, before you were requested to correct your testimony this morning, were you not?

MR. BLAKESLEE: Objected to as misleading as to the testimony of the witness, namely, that he made any mistake at all, the witness having testified that he answered in accordance with his understanding of the question.

A. No, sir, not at all.

RXQ. 930. (By MR. WESTALL:) And so neither counsel for complainant, for Mr. Henry, said anything to you about any mistake, before you were asked the question this morning?

A. No, sir; I simply read over the two claims yesterday evening, and noticed that in answering your question I had misunderstood it as I have stated, and that two different devices, I presumed, you had in mind, although I

don't know whether you did have, or not? one mentioned in Claim 3, and the other in Claim 4; and while my answer was absolutely correct as regards Claim 4, it naturally could not have been correct as regards the reference in Claim 3, because I thought one device was referred to in both claims, and upon reading the claims carefully I noticed that there were two different devices referred to.

RXQ. 931. You say you had no conversation with either complainant's counsel, or complainant regarding this mistake, before you testified this morning?

A. No, sir.

RXQ. 932. So, then, it was a remarkable coincidence that counsel for complainant asked the question that he did?

A. No, sir, I have answered the question and indicated to you the understanding I had of your question, namely, that you were referring to a single device as mentioned in both claims 3 and 4, and I stated very frankly and definitely, and I do so now, that I misunderstood your question, and I so stated to counsel; and I think I might add that if the question were read it might be found that, as the question was asked, I answered it practically correctly.

RXQ. 933. How much of the mechanism do you include under the designation "E" as being the clutch connection referred to in Claim 3 of Complainant's Exhibit A?

A. I would include the cylinder, the piston, the piston rod, probably extending through the stuffing-box, and the liquid contained within the cylinder.

RXQ. 934. You say "probably extending through

the stuffing-box." Would you be somewhat in doubt as to whether you should include—

A. (Interrupting): No, I would be merely in doubt as to whether it would also not include the rod which I have in my previous testimony lettered with the capital letter "G."

RXQ. 935. Do I understand that you wish to change your previous testimony—

A. Not in the least.

RXQ. 936. (Continuing) And now include this rod marked "G" on Complainant's Exhibit KKK?

A. It is immaterial as to whether it is included, or not.

RXQ. 937. So that you would consider that it might just as well be included as not?

A. Yes, sir, merely because the rod marked "G" is merely a continuation, outside of the cylinder, of the other portion of the rod which is within the cylinder on the inside of the stuffing-box.

RXQ. 938. The returning device for preventing the governor from overrunning is indicated by what letters in complainant's exhibit KKK?

A. The returning device is indicated by the letter "E."

RXQ. 939. And do you include in said returning device the cylinder, its casing, the piston and the piston-rod, and probably the rod "G", which you have previously pointed out as the clutch connection?

A. Yes. I would like to have the stenographer take down the question exactly as it was asked by counsel, since it is clear to me that he many times uses the words



“reversing clutch gear”, when he intends to say “clutch connection”.

MR. WESTALL: I will have to form my own questions, Mr. Witness, to suit myself.

MR. BLAKESLEE: If the question was changed after you started to answer it—

THE WITNESS: It was changed after I started to answer it.

MR. WESTALL: I will have to differ with the witness. The question was corrected just after the mistake was made. There can be no doubt as to the meaning of the question, and the witness is requested to answer the questions put to him, and not attempt to dictate what those questions shall be.

MR. BLAKESLEE: We object to the question as put because of its garbled form, and object to this line of procedure in an attempted cross-examination, and move that the answer, as far as given, be stricken out, because of the impropriety of the question and the uncertainty and indefiniteness as to the meaning of the question, and the nature of procedure of counsel for defendant in putting his question and reframing it.

THE WITNESS: The witness merely desires to say that he is not only willing, but anxious to answer counsel's question, but he cannot possibly answer counsel's questions unless they are put clearly and definitely, without putting words, phrases and clauses in the question and then withdrawing them because they do not properly belong to the question as he intends to put it.

MR. WESTALL: Will you please read the question?

(The reporter read Question No. 939, page 2153, beginning on line 22.)

THE WITNESS: If your question—

MR. WESTALL: He has answered that question, hasn't he?

THE WITNESS: I beg pardon, I have not.

MR. BLAKESLEE: We object to any talking off the record by anybody, in view of this procedure, and will ask counsel and witness both to address their remarks for the purpose of the record. Let the record show that counsel does not seem to know what he is about at all. He is talking to the reporter, talking to the witness, and talking into the air, and we object to the record unless it shows everything that is uttered in connection with this disturbance at present existing.

MR. WESTALL: Counsel for defendant insists upon the privilege of cross-examining this witness without constant interruption by the witness and by counsel.

MR. BLAKESLEE: Counsel wants to take a few lessons in cross-examination, and he will learn how.

RXQ. 940. (By MR. WESTALL:) So that if I understand you correctly, the same elements which you point out as the clutch connection, described at line 16 of Claim 3 of patent in suit, also constitutes a returning device mentioned in "Complainant's Exhibit A", and particularly at line 31 of page 5 in Claim 4 thereof? Is that correct?

MR. BLAKESLEE: Objected to, particularly as indefinite; it is not shown whether counsel intends the witness to understand that the matter referred to is at line 36 or line 31, and whether he understands the first part of line 16 to refer to "vice", or whether he wishes to include the ending portion of line 15. The question is indefinite and unanswerable.

THE WITNESS: Although I am only too willing to answer counsel's question, I cannot possibly answer definitely as it has been put, because it is not clear as to what he refers to in line 16 and line 31 of page 5.

MR. WESTALL: It is submitted that the question is perfectly clear and answerable if the witness saw fit to answer it. And the question is repeated.

COMPLAINANT (Mr. Henry:) Will you read that question, please?

MR. BLAKESLEE: Complainant contends that the question should contain the words and figures "or 31" after the figures "36" in this question, that being the manner in which the question was put by counsel for defendant; and the reporter and notary are notified that such will be the proper form of this question as certified and returned.

MR. WESTALL: I will ask the reporter if he hasn't the figures "36" in the question crossed out, and if he did not do so upon counsel for defendant correcting, during the course of the asking of the question, the figures referred to, to make them read "31", and also if he has not just read the question correctly to the witness.

MR. BLAKESLEE: This is no time for the reporter to testify in this case, and we do not propose to call him as a witness. So far as the reporter can go is to read the question as he has it. We have insisted upon what is the proper wording of that question. Any remarks by the reporter are not competent or proper.

MR. WESTALL: I will ask the reporter to put his answer to the question just asked him in the record.

MR. BLAKESLEE: We notify counsel that if he



insists upon this question it will constitute an abandonment of his cross-examination, and the cost of returning such cross-examination will be moved to be taxed in any event against the defendant.

THE WITNESS: The stenographer will take down this as my preliminary answer—

MR. WESTALL: (Interrupting) I object to any preliminary answer being made until—

THE WITNESS: (Interrupting) I withdraw that, then, following the method of counsel in withdrawing almost all that he says. Will the reporter please read the question, and I will attempt to answer it, qualifying it in such manner as to make it accurate as it is answered.

MR. WESTALL: The witness will kindly refrain from interrupting until he is asked to answer the question. This whole proceeding is merely an attempt to evade a question which the witness feels that he cannot answer, and which has placed him in a very serious dilemma, and all this controversy at this time is aimed only to the accomplishment of an object of preventing the witness answering a very vital question.

MR. BLAKESLEE: The attention of the reporter and examiner to Rule 51 of the equity rules of this court, promulgated by the United States Supreme Court, is invited, and he is cautioned to abide thereby in transcribing and returning the present portion of the record, because of the argumentative indulgences of counsel for defendant.

MR. WESTALL: I will now ask the reporter to answer the question previously put to him, in order that this matter may be made clear for the benefit of the

Court, I would further suggest that this reporter is acting as the agent for the special examiner in this case under stipulation, and his statement of record as to what happened is a very proper means of shortly terminating this controversy.

MR. BLAKESLEE: I again object to the notary doing any such thing, for the reasons stated, and disavow any responsibility for the taking and returning of this deposition, or the cost thereof, and insist that counsel for defendant is abandoning his cross-examination of the present witness and must abide by the results of such attitude. We further insist that all the notary can do is to read what record he has made. If he has not performed his duty he cannot tell us about it. That is a matter for the record to make clear; and we have pointed out wherein his record, as already read, does not conform with the question as it was put by counsel.

MR. WESTALL: Counsel for defendant merely states that the reporter has already stated that he corrected the question as it was put during the time it was being put, and has read it as corrected before it was answered, or before it was attempted to be answered. And I will again ask the reporter to please answer the question so that his statement may be shown of record.

MR. BLAKESLEE: Counsel is now testifying without being sworn, and his statement can be of no effect further than the statement of the reporter could be of any effect. He is not a witness; he is not empowered to pass upon any validity or correctness of the record, or upon any question of evidence involving the same, and we object and protest against any such procedure. It is not contemplated by the rules, and unheard of.

THE WITNESS: We will talk informally for a moment. I will do my best to answer your questions.

MR. WESTALL: You don't need to assure me of any such thing. Answer the questions and that will be sufficient.

THE WITNESS: I am talking as Mr. Cory to Mr. Westall.

MR. WESTALL: I am perfectly aware of that, but if you will answer the questions, no explanation will be necessary.

THE WITNESS: If you choose to interrupt me when I am talking as Mr. Cory to Mr. Westall—

MR. WESTALL: There is no occasion for you to so talk at the present time.

THE WITNESS: All right; go ahead as counsel. You ask intelligent questions and I will answer them just as definitely as I can.

MR. WESTALL: I have several times asked the reporter to answer a certain question of record. Do I understand that he refuses to answer that question?

THE REPORTER: No.

MR. BLAKESLEE: I object to any further continuation of this punch-and-judy show going on here, in which counsel for defendant is taking the part of both Punch and Judy, and insist that if counsel has any further questions to ask, that he ask them and ask them correctly, and not quarrel with the reporter, nor with the witness, nor take procedure which he should know is not proper in any such proceedings as this. This is the time and place to cross-examine and not to give exhibitions of unfamiliarity with rules or irregularity in conduct.



MR. WESTALL: It is to be noted of record that the reporter has been asked repeatedly to answer a certain question, in order that the record may be made clear, but that he stands mute and refuses to make any answer.

THE REPORTER: I will have to ask that silence be had, in order that I may look up my notes. I have forgotten what question Mr. Westall asked me, and will ask him to repeat it.

MR. WESTALL: I will ask the reporter if he hasn't the question asked him in his notes, and if he cannot readily turn to it.

THE REPORTER: Yes.

MR. BLAKESLEE: Just a moment. The reporter is advised that he is doing all of this punishment at his own risk, and without any hope of return either for himself or the special examiner, as the procedure is merely a time-wasting, unsupported and foolish procedure, which no Court would permit for a moment. What the opinion of the reporter may be is immaterial in the proof of this case; the record speaks for itself. He may read if he wishes from the record, but we radically protest against his adding anything from his own mouth to the record.

MR. WESTALL: The reporter is once more asked to turn to the question that was asked of him and answer it, or, at least to state of record that he declines to answer it.

(The reporter examines his notes.)

MR. BLAKESLEE: We will allow counsel two minutes to continue his cross-examination; if such time is not taken avail of, we will conclude the deposition of this witness and go on with this case.

(The reporter read the question asked of him by Mr. Westall, as follows: "I will ask the reporter if he has "not the figures '36' in the question, crossed out, and if "he did not do so upon counsel for defendant correcting, "during the course of the asking of the question, the figures referred to, to make them read '31', and also if he "has not just read the question correctly to the witness?"")

THE REPORTER: Yes.

MR. BLAKESLEE: I move to strike out all of this matter, including the answer of the reporter, as irrelevant, incompetent and immaterial and not part of this cross-examination or this proceeding in any respect.

MR. WESTALL: I will now ask the reporter to repeat the question to the witness as corrected by him during the time it was being asked, and that the witness now answer the question.

MR. BLAKESLEE: This question has already been answered, and we notify counsel that he must immediately put another question, or we shall take over the witness for further redirect examination. Note on the record here, at this point the redirect examination of the witness was resumed.

MR. WESTALL: Counsel for defendant protests against this interruption of the cross-examination by counsel for complainant, and if this course is persisted in will insist upon the entire deposition of this witness being stricken out upon the ground that the witness has refused, under counsel's suggestions, to submit to proper cross-examination, and counsel for defendant insists upon his right of cross-examination of this witness,

states that he has many questions yet to ask which he has not had an opportunity to put, owing to the interrupting tactics of counsel for complainant and the witness, and insists upon an answer being given to his question by the witness, and insists at this time upon the right to complete the cross-examination of this witness. Counsel does not understand that as soon as a witness becomes confused and unable to answer questions, that counsel calling him has a right to withdraw him from examination, in order to save him from the embarrassment of confusing his testimony. And I will then ask the witness to please answer the question as corrected, inasmuch as he has insisted that he did not understand the question, and that it was confusing.

MR. BLAKESLEE: Counsel seems to be able to do nothing but protest, and does not seem to be able to conduct a cross-examination. We will, therefore, have to take the witness over, and after we have completed our examination we will see what further questions counsel for defendant has in store for him.

MR. WESTALL: Do I understand—

MR. BLAKESLEE: (Interrupting) RDQ. 941. Referring, Mr. Cory, to the part marked "F" in Complainant's Exhibit KKK, will you please state to me what that designates, as you understand it?

MR. WESTALL: Counsel for the defendant objects to the question as entirely improper, as an attempted curtailment of the right of cross-examination of this witness, as an attempt by leading questions to coach the witness so that he will not do further damage to complainant's case.

MR. BLAKESLEE: The attention of the reporter is called to Rule 51 of the Equity Rules again. It is about fifteen minutes since counsel for defendant put a question, and we cannot allow our time to be wasted by him, if he does not care about his own time.

MR. WESTALL: Counsel for defendant denies that any time has been lost at all.

MR. BLAKESLEE: The record speaks for itself.

MR. WESTALL: And insists now on going on with his cross-examination, and protests against the interruption of counsel for complainant in attempting to thus save the witness.

MR. BLAKESLEE: Now, Mr. Cory, will you answer the question?

(The reporter read Mr. Blakeslee's question, No. 941, commencing on line 29, page 2161.)

MR. WESTALL: Counsel for defendant also suggests that this is entirely in line with the tactics of counsel for complainant in directing his expert witnesses to refuse to answer when some vital question in which their admissions might be damaging, is asked.

MR. BLAKESLEE: That, as counsel for complainant, I squarely deny and brand as untruth, and the record will speak for itself in support of my statement. Now, read the question to the witness, please.

(The reporter again read Question No. 941.)

MR. WESTALL: Notice is hereby given that upon the grounds stated counsel for defendant will move to strike out the entire deposition of this witness at the time of the hearing.

THE WITNESS: The witness desires to state at this



point that he is only anxious to comply in every respect with the desire of counsel for defendant, as well as of counsel for complainant, and hereby expresses himself as not only personally willing, but entirely anxious to answer to the very best of his ability any questions that are put to him by counsel for the defendant, and at this time understands that he has answered the last question put to him by counsel for the defendant. If he has not so answered it he hereby expresses a desire and a willingness to answer the question if it is re-read by the reporter.

MR. WESTALL: Counsel for defendant protests against the witness making statements of record when not called upon to testify, and states that he will move that the cost of transcribing and taking all of this testimony be taxed against complainant; and he again insists upon his right to cross-examine this witness.

THE WITNESS: Will you read counsel for defendant's last question, Mr. Reporter, please?

MR. BLAKESLEE: We inform the witness that he has been taken over by the complainant, and that it is in line with proper procedure for him to answer the question just put by counsel for complainant. However, if the witness feels that he has in any way been obstructed from giving any answer or any testimony which he wishes to give responsive to questions by defendant's counsel, he is by all means permitted to give such answer or testimony, as we have only a desire to conduct the taking of testimony here, but have protested against a complete upsetting of the proceedings, and its conversion into a mere time-wasting and record-stuffing and senseless junket.

(The reporter read Mr. Westall's question No. 940, as follows:

“RXQ. 940. (By MR. WESTALL:) So that if I “understand you correctly, the same elements which you “point out as the clutch connection, described at line 16 “of claim 3 of patent in suit, also constitutes a returning “device mentioned in ‘Complainant’s Exhibit A’, and “particularly at line 31 of page 5 in Claim 4 thereof? Is “that correct?”)

MR. BLAKESLEE: Our objections against the form of this question are repeated.

A. If the counsel refers to line 16 and line 31 on page 5 of the patent in suit, namely, the Lyndon patent, I will answer the question by saying that the words “clutch connection” in lines 16 and 17, page 5 of the patent, and the words “returning device” in lines 31 and 32 of page 5 of the patent, correspond to the device marked “E” upon “Complainant’s Exhibit KKK”.

RXQ. 942. (By MR. WESTALL:) And when you say that this clutch connection mentioned in Claim 3 of the Lyndon patent in suit corresponds to the “returning device” mentioned at lines 31 and 32, page 5 of said Lyndon Patent in suit, you mean to say that they are mechanical equivalents, do you?

A. Yes, sir, as set forth in the specifications of the patent in suit, page 2, beginning on line 12, “A returning “device consisting of a rod 25, connected by a pivoted “link or connecting-rod 25 A with the disk 22, passes “through a hole in the controller-lever 26, pivoted at “26a to a fixed support,” etc.

Further, on page 3, beginning with line 134, “which

“causes engagement of disks 23 22, and causes the disk  
“22 to be carried slightly around one way or the other,  
“according to the direction of movement of the governor  
“shaft 12, thereby returning the lever 26 to normal  
“position. This movement of the returning-rod 25,”  
etc.

RXQ. 943. Do I understand you correctly then as saying that the returning device used in the patent in suit refers—make it the term “returning device”—refers to and is synonymous with the clutch connection described in said patent in suit?

A. I could only answer that question by reading from line 12 on page 2 of the patent in suit, “A returning device consisting of a rod 25, connected by a pivoted link  
“or connecting-rod 25a with the disk 22.” Also on page 2 of the patent, line 3, “On the same shaft is a disk 23, “normally out of contact with disk 22, but movable end-  
“wise on said shaft into contact”. The clutch connection referred to in Claim 3, lines 16 and 17, refers to the two disks and their operation—probably specifically; these two disks bearing the numbers 22 and 23.

RXQ. 944. Do I understand you, then, to interpret the language just quoted to mean that this clutch connection mentioned in Claim 3 of the patent in suit, and the term “returning device” as used throughout the patent, are not synonymous?

A. No, I should not say they are synonymous, but they consist of various parts, and I would understand it from the reading of the patent that the returning device includes the disks 22 and 23 as a part of the operating mechanism.

RXQ. 945. So that the clutch connection, as you understand the patent, is not the returning device, but is a part of the returning device?

A. It may be so stated, yes, sir.

RXQ. 946. Is it properly so stated?

A. In my opinion it is, yes, sir; that is my understanding of the description of the patent.

RXQ. 947. So that when you point out upon Complainant's Exhibit KKK the parts included under the letter "E", including, as you have said, the cylinder casings, the piston, the piston rod, and the liquid contained within the cylinder, and probably the part "G" as the equivalent of the returning device mentioned in the Lyndon patent in suit, and as also equivalent to the clutch connection mentioned in Claim 3, you are reading the terms "returning device" and "clutch-connection", in pointing out alleged equivalents in "Complainant's Exhibit KKK" as synonymous terms, are you not?

A. No, I would not be understood as using them as synonymous terms. It is merely the understanding as to whether the returning device may be considered as including the disks 22, 23—so-called clutch connection—or whether the returning device might be limited entirely to rod 25 and the solenoid connected therewith, as stated on page 2, line 12, beginning with the words "A "returning device consisting of a rod 25, connected by a "pivoted link or a connecting rod 25a with the disk 22". I would not wish to be considered as—

MR. BLAKESLEE: (Interrupting) Excuse me. You said "or a connecting-rod".

A. "Or connecting-rod". I do not wish to be under-



stood as saying that the returning device is synonymous with the clutch connection, but merely that the returning device may be considered as including not only the rod 25 but the disks 22 and 23.

RXQ. 948. (By MR. WESTALL:) In pointing out the parts included under the capital letter "E" on Complainant's Exhibit KKK, that is to say, the cylinder casing, the piston, the piston-rod, the liquid contained in the casing and probably the rod "G" as equivalent of the clutch connection mentioned in said Claim 3 of the Lyndon patent in suit, and also in pointing out the same identical elements as the returning device for said controller, you do not find, then, a returning device provided with a clutch connection as called for by Claim 3 of the Lyndon patent in suit, do you, in Complainant's Exhibit KKK, in that the so-called returning device as pointed out by you is the so-called clutch connection, and therefore, could not properly be described as being provided with a clutch connection. Is that correct?

MR. BLAKESLEE: Objected to as placing a false interpretation upon the testimony of the witness, and furthermore, as being merely argumentative and not cross-examination; an attempt at testifying and drawing conclusions upon the part of counsel.

A. I find that the cylinder "E" on Complainant's Exhibit KKK, with its component parts, is substantially the mechanical equivalent of the returning device, and I do not wish to have myself understood as limiting the return device solely to the clutch connection, since on page 2 of the patent it is definitely stated "A returning device consisting of a rod 25," etc., with other component parts.

RXQ. 949. (By MR. WESTALL:) Then do I understand you to mean that you wish to alter your previous testimony and include other parts besides the cylinder casing, the liquid within the casing, the piston, the piston-rod, and probably the rod "G", as properly forming the equivalent of said returning device?

A. No, I do not desire to change my previous testimony.

RXQ. 950. You will notice that there is attached or used in connection with the parts included under the term "E", namely, the cylinder casing, the liquid within the cylinder, the piston and the piston rod, and probably the rod "G" pointed out by you as the returning device, and also as the clutch connection of Claim 3, certain other devices consisting of the parts marked on "Complainant's Exhibit KKK" of the parts indicated by the letter "e". To what parts or elements of the patent in suit are those parts marked "e" more closely analogous?

A. Referring to Claim 4, lines 32 and 33, the parts marked "e" on "Complainant's Exhibit KKK" refer to the "actuating means controlled by said controlling means to return the controller to inoperative position, so as to prevent excessive movement of the governor."

MR. WESTALL: Let it be noted of record that the witness is endeavoring to find an answer to the question for about five minutes.

THE WITNESS: I have no further answer to the question.

MR. BLAKESLEE: Isn't there an answer there, Mr. Reporter?

THE REPORTER: Yes.

THE WITNESS: I thought the answer was completed.

MR. BLAKESLEE: Let it be noted that counsel has been standing around without putting any question, and the witness and the rest of us have been wasting our time.

MR. WESTALL: Let it also be noted that the witness had stated that he had not completed his answer before he started to use the telephone.

RXQ. 951. Claim 3 at line 16, of page 5 of the patent in suit calls for a clutch connection to said operating shaft. Will you please now point out the operating shaft referred to in "Complainant's Exhibit KKK"?

A. The operating shaft referred to is the water-gate-operating shaft as set forth in line 11, page 5, of Claim 3; and this water-gate-operating shaft in "Complainant's Exhibit KKK" corresponds to the shaft marked "F", this "F" being in red, with a pencil letter "R" on top of it.

RXQ. 952. You will notice that the part you have pointed out as the operating shaft, namely, the part "F", is not directly connected with the parts you have pointed out as the clutch connection mentioned in Claim 3, namely, the cylinder casing, the piston, the piston rod, the liquid contained within the cylinder, and probably the rod "G". Can you properly say that this so-called equivalent of the clutch connection just referred to is a clutch connection to said operating shaft "F"?

MR. BLAKESLEE: Objected to as merely argumentative and not proper cross-examination. Further-

more, we object to this line of alleged cross-examination as being improper, and not cross-examination at all, and a mere reiteration of the testimony of the witness, or tending to cause such reiteration, and which testimony on record, it is believed will show, was adduced by counsel for defendant in cross-examining this witness in the prima facie case.

A. I find, upon more carefully noting the complainant's exhibit KKK that I did not refer to the proper shaft as the water-gate-operating shaft, but it is in effect what is indicated by lever arm J, the shaft, of which is definitely connected through connecting rod "I", bell crank H, to the equivalent of the clutch mechanism E.

RXQ. 953. (By MR. WESTALL:) Will you please define a clutch connection as used in common parlance?

MR. BLAKESLEE: Objected to as not cross-examination, not the time for defendant to attempt to make out a defense in this case.

A. A clutch connection is one which provides intermittently the connection of a driving shaft with a driven shaft, the clutch connection referring to the bringing together of two surfaces that, by friction, will hold together, so that a shaft may be operated, or not, and depending upon whether the clutch is closed or opened; and in some cases such clutch connections, as in this one, may be operated in either the one or the other direction, or not operated at all.

RXQ. 954. (MR. WESTALL). Is it proper to refer to a cylinder casing, a piston and a piston-rod, with the liquid contained in a casing, as a clutch connection?

A. I think so, yes, sir.



RXQ. 955. Claim 7 of the Lyndon patent in suit calls for "means for returning the by-pass valve to normal position on completion of the governing movement". Will you please indicate briefly by letter upon "Complainant's Exhibit KKK" where you find the element referred to?

MR. BLAKESLEE: The same objections as to the impropriety of this procedure as cross-examination are to be noted.

A. Referring to Claim 7, line 73, "A means for re-" "turning the by-pass valve to normal position on completion of the governing movement of the water-gate-operating-means", on "Complainant's Exhibit KKK"—this means is represented by the device designated by the letter "M".

MR. BLAKESLEE: Let the record show that counsel has refrained from putting a question in the neighborhood of five minutes, and we suggest that he close up his cross-examination.

RXQ. 956. (By MR. WESTALL:) Will you please state some examples of where clutch connections such as defined by you are used?

MR. BLAKESLEE: Objected to as not cross-examination.

A. They are used in connecting up a driven line shaft with a line shaft which it is desired to stop. They are used where the proper design of clutch connection is adopted, where the driven shaft may be stopped when desired, and by means of double shafting, or concentric shafting, where the driven shaft may be operated in either one direction or the other, or allowed to stand still if desired.

RXQ. 957. (By MR. WESTALL:) Can you think of any particular pieces of mechanism that such clutch connection is used in?

MR. BLAKESLEE: The same objection.

A. Very largely in printing presses and devices of that character.

RXQ. 958. (By MR. WESTALL:) Could you take out such a clutch connection, out of a printing device such as you have mentioned, and substitute for it the combination of the piston, piston-rod, cylinder, and particularly the liquid within the cylinder, so as to perform the same function as the clutch connection?

MR. BLAKESLEE: The same objection.

A. Yes, sir, very readily, particularly where reciprocating presses are used, where the direction of movement of the press is backward and forward, that may be done by means of a cylinder and piston, or it may be done by means of a clutch connection which will be geared through a rack on the bottom of the press; the two results being absolutely equivalent in producing reciprocating motion of the movable part of the press.

RXQ. 959. (By MR. WESTALL:) I will ask you to please take a piece of paper and draw or sketch two shafts connected by a clutch connection, and then upon the same piece of paper, below, illustrate how the same result could be accomplished by connecting those two shafts with a cylinder casing, a piston, a piston rod and liquid within the cylinder?

MR. BLAKESLEE: Objected to as indefinite and not cross-examination.

A. Take first the cylinder with a piston and piston-

rod; it would only be necessary to place a rack on the end of the piston which would gear with the teeth of the pulley to be driven in either direction, P, it being apparent that by moving the piston, piston rod and the rack on the piston rod in either direction, rotation of the pulley "P" would be produced in either direction. If we desired to get a similar clutch mechanism we might have, represented in plan, a pulley to be driven, marked "D", connected to the shaft marked "S", there being above the pulley marked "D" another pulley mounted upon a hollow shaft S', driven in one direction, say clockwise, and below another pulley driven, running anti-clockwise, and it will be only necessary to bring the driven pulley "D" into contact with the upper pulley, "U", whereupon the driven pulley "D" would be driven would be driven in one direction, and if brought in contact with the lower pulley "L", the pulley "D" would be driven in the opposite direction, and wherein it is shown that the driven pulley "D" with the clutch mechanism will be operated exactly the same as the driven pulley "P" with the cylinder and piston and connecting rod and rack thereon; cylinder and piston marked "C" and P' respectively; piston-rod "R".

RXQ. 960. (By MR. WESTALL:) I notice that you have produced upon the paper three figures. For the sake of clarity I will ask you to please give each of the figures a number, and then briefly indicate what each of the figures are intended to represent?

MR. BLAKESLEE: The same objection as last noted.

A. I have drawn three figures upon the sheet of pa-

per, one of which, however, I changed to a plan drawing from an end view; so there are in reality but two figures represented upon the sheets of paper. The figure which I indicate as "I" represents a cylinder, "C", within which there is a piston "P" that may be moved backward or forward, or allowed to stand still by virtue of difference in pressure or equality of pressure upon the two sides of the cylinder exerted by a liquid, gas, vapor or otherwise. Connected to the piston is a rod "R", upon which is mounted a rack, "A", gearing with the driven pulley "P".

Figure II represents a shaft to be driven, "S", upon which is mounted a pulley "D"; a driven shaft S' upon which is mounted one part of a clutch connection "U", rotating, we will say, clockwise, and also a second shaft "S 2" carrying a clutch connection "L". The driven pulley will be set in motion in a clockwise direction, we will say, if brought into contact by any means with the upper pulley "U", and will be driven, we will say, in an anti-clockwise direction if brought into contact with the pulley or friction surface mounted on "L", shaft "S 2",

MR. WESTALL: Defendant offers in evidence the sketch just produced by the witness as "Defendant's Exhibit Cory Cross-Examination Sketch No. 1".

MR. BLAKESLEE: The offer of this purported exhibit is objected to on each of the grounds of objection urged against the question as pertinent to the same and as immaterial, irrelevant and incompetent, and particularly not part of any proper cross-examination; and we move to exclude it from the consideration of the Court and from use as an exhibit.



RXQ. 961. (By MR. WESTALL:) I notice that you have not literally complied with the request of the question, in that the question calls for an illustration showing the use of only a cylinder casing, a piston within the cylinder, liquid within the cylinder, and a piston-rod, to perform the function of a clutch connection, and that you have added two new elements, namely, a rack "A" and a pulley "P". Will you kindly state whether or not you are able to illustrate in any way the use of only the elements comprised within the designation "E" and just repeated by me, "Complainant's Exhibit KKK"?

MR. BLAKESLEE: Objected to as meaningless and misleading, and not proper cross-examination and improperly repeating the testimony of the witness.

A. No, there would be necessary some device capable of converting the reciprocating motion of the piston-rod "A" into the rotary motion of the pulley "P", either by means of a connecting rod, a crank-shaft, or a rack or gear, and so on; and it is true that as indicated on the "Complainant's Exhibit KKK" "E" may be thought of as not including these additional devices; but if such a rack or its equivalent, a spiral, were included as a part of the connecting rod or movable cylinder, the entire equivalent of the two is thereby represented, and the reciprocating motion of the piston, or if the piston is stationary, the reciprocating motion of the cylinder, is transmitted into a rotary motion, or vice versa, by means of the equivalent of a rack and pinion or spiral thread or connecting-rod.

RXQ. 962. (By MR. WESTALL:) Please state whether or not you consider a clutch connection such as

you have illustrated on "Defendant's Exhibit Cory Cross-Examination Sketch No. 1", or such as called for in Claim 3 of the Lyndon Patent in suit, to be the same, or substantially the same means for connecting the two shafts, as a cylinder case, a piston within the casing, a piston-rod and liquid within the cylinder?

A. I would consider them substantially the same means.

RXQ. 963. Could you give a reason for your last answer, briefly?

MR. BLAKESLEE: The same objection. These objections are to be noted as urged against all this line of alleged cross-examination, without the necessity of repetition.

A. I consider them substantially the same means because, first, substantially the same result is obtained, namely, the rotation in either direction of the pulley which is being driven; secondly, that the means of obtaining this result is exactly the same.

RXQ. 964. (By MR. WESTALL:) Your idea, I take it, then, is that any mechanism that leads to a similar result can be described as the same means, or substantially the same means?

MR. BLAKESLEE: Objected to on the grounds last urged, and as merely argumentative. This is not the place for counsel to argue his case, nor is it the time. If he wishes to cross-examine, let him proceed.

A. No, I would not consider that similar results only would be necessary, but I should say substantially the same result, brought about in substantially the same manner, by the two means.

RXQ. 965. (By MR. WESTALL:) Would make them substantially the same means?

A. Yes, make them substantially the same means, and they would be mechanical equivalents.

MR. BLAKESLEE: The same objection.

RXQ. 966. (MR. WESTALL:) A hole in the ground may be dug with a pick and shovel, or it may be blasted out with dynamite. Would you consider the manual labor of digging a hole, or the dynamite, as substantially the same means because they lead to the same results?

MR. BLAKESLEE: Objected to as merely argumentative and not cross-examination, and upon the ground last urged.

A. I would not, because in the first place they would not lead to the same result; could not by any physical interpretation lead to the same result.

RXQ. 967. (By MR. WESTALL:) Notwithstanding the impossibility, then, as you have testified, of using a cylinder casing, a piston within a cylinder, a piston-rod, and the oil within the casing, alone, to perform the function of a clutch connection, do I understand that you would still say that they were mechanical equivalents?

MR. BLAKESLEE: Objected to as improperly quoting the testimony of the witness and as stating on its face an absurdity, as a thing cannot be a connection unless it connects something.

A. No, I would not so consider it unless the connecting-rod were other than simply a plain, round cylindrical rod, because the additional devices that I have previously

mentioned would be required to convert the reciprocating motion into the motion of rotation; such as a rack and pinion or connecting rod and crank and so on.

RXQ. 968. (By MR. WESTALL:) In pointing out the cylinder "A", and certain adjacent parts as the equivalents of the reversing clutch gear of Claim 4 of Complainant's Exhibit A, I believe you first included as the constituent members together constituting such alleged equivalent, upon your cross-examination, the piston-rod. On redirect examination in making the same comparison, you omitted the piston-rod of such cylinder, or such parts included under the designation "A" in "Complainant's Exhibit KKK". Do I understand you correctly as wishing to alter your testimony by omitting such piston-rod?

MR. BLAKESLEE: Objected to in so far as it is contrary to the testimony of the witness, and not cross-examination, and argumentative, an attempted argument on the record, and contrary to the rules.

A. No, I would not desire to be understood in this particular instance as eliminating the piston rod.

RXQ. 969. (By MR. WESTALL:) And you do not wish to change your testimony in any way as to including the liquid within the cylinder, do you?

A. No; liquid or gas, or vapor, something to exert a pressure, either in the one direction or the other would be necessary.

RXQ. 970. Do you also testify, or is your former testimony to be interpreted to mean that you consider the combination of the cylinder case, the piston, the piston rod, and the liquid or gas used to move the piston, al



comprised under the designation "A" of Complainant's Exhibit KKK, as not being capable of being substituted without the addition of any other parts to perform the function of a reversing clutch-gear, or of a clutch-gear.

MR. BLAKESLEE: The same objection, and not proper cross-examination.

A. I would wish to be understood as I previously testified, that it would be necessary to have some device to transform the reciprocating motion of the piston rod or its equivalent to a rotary motion, such as a crank, shaft, connecting rod, or rack or pinion.

RXQ. 971. (By MR. WESTALL:) So that you will not broadly say that a cylinder casing, a piston, a piston-rod and the liquid or gas used to actuate a piston, in combination, and without other means, can be considered the equivalent of a reversing clutch gear?

A. Not by themselves, no, sir, because they could not, with simple, smooth parts, produce rotation from the reciprocating motion of the piston rod, or the containing cylinder.

RXQ. 972. And you would not consider the parts mentioned in my last question as performing the same result as a reversing clutch gear, I take it, in that you have stated that they could not alone be used to perform the function of a reversing clutch-gear?

MR. BLAKESLEE: The same objection.

A. No, I would not consider the parts mentioned only, without some method of converting the reciprocating motion of the piston into motion of rotation.

RXQ. 973. (By MR. WESTALL:) You have stated upon your redirect examination that you never saw a

plug-cock valve in which the body was not in contact with its casing? I may have misinterpreted your testimony to the extent of believing that you said that you had had experience of a plug-cock valve in which the cylinder was of such proportions and so supported at each of its ends as not to come in contact with its casing. If your testimony is not susceptible of any such interpretation will you please state whether or not you wish to adopt that interpretation as the correct one?

A. My testimony is not capable of any such interpretation, as I remember it. I did not testify to the conditions set forth in your question.

RXQ. 974. And you have never seen a plug-cock valve, or any valve, constructed so that its cylinder, being supported at both of its ends by a shaft or trunion, was so proportioned as that its body did not come in contact with its casing? Is that correct?

A. That is correct except when the valve is taken apart and the cylindrical plug-cock taken out, when, of course, it would not touch the casing; but when it is in position to operate and open and close, the outer surface of the cylindrical plug-cock would be in contact and touch the surrounding casing.

RXQ. 975. So that any testimony you have given as to how a valve so constructed would operate, or would fail to operate—your conclusions were based upon matter of theory only?

MR. BLAKESLEE: Objected to as misleading and falsely argumentative, in that the witness has repeatedly testified that any such hypothetical plug-cock or stop-cock valve construction would not be a stop-cock valve or plug-

cock valve at all, and in fact, would not be a working valve at all; so that it is impossible for any one to see a thing which cannot be.

A. My answer is no, sir. My answer is based upon practical experience with many plug-cock valves of large dimensions, and not solely upon theory, at all.

RXQ. 976. (By MR. WESTALL:) I will ask you to please point out in the patent in suit the parts more clearly analogous to the parts marked "M" upon "Complainant's Exhibit KKK"?

MR. BLAKESLEE: Objected to as heretofore, as not proper cross-examination, and as merely repetitious of a question asked about forty-five minutes ago relating to this identical part; almost in the same words; this being merely a reversal of such question, the effect being the same.

A. The parts marked 58, 57, 59, 58a, 61, 62, 63, 64 and the ropes 51, 52, etc.

RXQ. 977. (By MR. WESTALL:) How much of the element or combination of elements marked "M" in "Complainant's Exhibit KKK" do you include as the equivalent of "means for returning the by-pass valve to "normal position on completion of governing movement "of the water-gate-operating means" as described in the last three lines of Claim 7 of "Complainant's Exhibit A"?

A. I would include the part "M", as there shown, and as so indicated, and the means for connecting this part "M" to the part which has been designated as part "E".

RXQ. 978. Will you please indicate, or mention by letter each of the parts which you have so included?

A. As I understand the limitation of your question, namely, beginning with line 78, reading, “means for re-  
“turning the by-pass valve to normal position on comple-  
“tion of governing movement of the water-gate-operat-  
“ing means”, it limits that to the device “M”.

RXQ. 979. Will you kindly mention the separate parts which you comprise within the designation “M” on said “Complainant’s Exhibit KKK”?

A. The separate parts would consist of a cylinder and the rod entering therein, and springs wound oppositely on each side, and liquid within the cylinder; the cylindrical casing itself being connected with the rod of the by-pass needle valve.

RXQ. 980. You have referred to, as the second element comprised within the designation “M” on said “Complainant’s Exhibit KKK”, a “rod entering therein”. Please state how much of the rod you include?

A. I would consider the rod up to its connection with the lever arm “N”.

RXQ. 981. But you would not consider the lever-arm “N”, or any other part connected to it as being comprised within the equivalent of “means for returning  
“the by-pass valve to normal position on completion of  
“governing movement of the water-gate-operating  
“means”, as described in said Claim 7?

A. No, I don’t think necessarily.

RXQ. 982. Now, you have referred to, among other things, comprising the “means for returning the by-pass  
“valve to normal position on completion of governing  
“movement of the water-gate-operating means”, the  
“clutch consisting of corresponding disks or cones 57,



“58, respectively” as described on page 2, line 82 of “Complainant’s Exhibit A”. I will ask you to state whether or not you consider the combination of a cylinder, a rod entering therein, as described by you, springs wound oppositely on each side, liquid within the cylinder, as, in combination, forming the mechanical equivalent of the said parts 57 and 58 of “Complainant’s Exhibit A”?

MR. BLAKESLEE: Objected to as not quoting the specification of the patent accurately, and on all the grounds last urged.

A. I would say that the pulleys 57 and 58 in figure 1 of the Lyndon patent, and the connections thereto, were the mechanical equivalent of the device marked “M” on KKK; the method of operation and the result to be accomplished being to allow the by-pass valve to come to its normal position at a time after the main gate valve has come to its final position in its governing movement.

RXQ. 983. (By MR. WESTALL:) I will ask you to please mention by number each of the parts or elements of complainant’s Exhibit A which, in your opinion, find their equivalent in the cylinder, rod entering therein, and springs would oppositely on each side, liquid within the cylinder, comprised within the designation “M” on said “Complainant’s Exhibit KKK”?

A. I will give you those numbers as I can read them from figure 1, as representing all of the devices transmitting motion from the water-gate shaft 20 containing the gear 19, to the by-pass valve; this motion being transmitted through the cone pulleys, or clutches 58, 57, the ropes 51, 52, the stem 49, etc.

RXQ. 984. Will you please merely mention by number each of the parts that you would include under the designation in the last answer?

A. I would mention the numbers 51, 52, 50, 49, 53, 54, 57, 58, 59, 58a, 65, 66, 70-70, 69.

RXQ. 985. Do I understand you as testifying or intending to testify that the parts which you have mentioned by number in the last preceding answer, in your opinion are substantially the same means as the parts included by you under the designation "M" as heretofore defined by you on "Complainant's Exhibit KKK"?

A. Yes, sir.

RXQ. 986. Now the parts comprised under the designation "M", consisting of the cylinder, the rod entering therein, and springs wound oppositely on each side, and liquid within the cylinder, are not used to connect and disconnect two shafts, like the members 57 and 58 of the Lyndon patent in suit, are they?

MR. BLAKESLEE: Objected to as meaningless, inasmuch as the parts 57 and 58 are clearly not shafts, nor defined as such; and furthermore, as incompletely summarizing the testimony of the witness who, in his previous answers, has added to the parts comprised in "M" the other necessary parts entering into that device, whereby the springs are caused to be compressed?

A. No, sir, they are not, definitely, but they both serve the same purpose, to allow the by-pass valve to have a comparatively small motion, absolutely independent of the main gate valve; the result, as set forth in the Lyndon patent in suit and in "Complainant's Exhibit KKK", being the same in each case.

RXQ. 987. (By MR. WESTALL:) Are there two shafts comprised within your designation "M" on "Complainant's Exhibit KKK"?

A. No, sir.

RXQ. 988. And the rod that enters into the cylinder comprised within the designation "M" on "Complainant's Exhibit KKK" does not impart any rotary motion to any valve stem, does it?

A. No, sir.

RXQ. 989. The purpose of the parts mentioned as being comprised within the designation "M" on "Complainant's Exhibit KKK" is merely to permit an elasticity in the opening or closing of the needle valve of the auxiliary nozzle, is it not?

MR. BLAKESLEE: Objected to as meaningless and as argumentative, and not cross-examination.

A. I would not think that would be the correct statement. What it provides is a means whereby the by-pass valve is allowed to move without a corresponding, or at the same time any motion whatsoever of the gate valve. You might cover that, if you choose, perhaps, by using the word "elasticity".

RXQ. 990. (By MR. WESTALL:) Suppose that the parts comprised under the designation "M" on "Complainant's Exhibit KKK", that is to say, the cylinder, the rod therein, springs wound oppositely on each side, and the liquid within the cylinder, were eliminated, and the needle valve stem were connected directly to the part "N" without the intervention of the parts mentioned and comprised within the designation "M" on "Complainant's Exhibit KKK"; what would be the effect as to the operation of the device?

A. It would mean that it would be absolutely impossible to move the by-pass valve even a slight amount without there being some motion at the same time of the water-gate.

RXQ. 991. Now, suppose that you eliminate parts 51, 52, 50, 49, 53, 54, 57, 58, 59, 58a, 65, 66, 60-70 and 69 from the device disclosed in the Lyndon patent in suit; what would be the effect as to the operation of the device as a water-wheel governor?

A. It would not operate at all, because the water-gate would operate, and the by-pass valve would not move; no means of giving motion to the by-pass valve at all.

RXQ. 992. The parts mentioned in my last question are absolutely essential to the operativeness of the device, are they not?

A. Yes, sir.

RXQ. 993. But the parts included under the designation "M" on "Complainant's Exhibit KKK" are not absolutely essential to an operation of the device illustrated in said "Complainant's Exhibit KKK"?

A. Yes, they are, because the same result is accomplished by the device "M" of "Complainant's Exhibit KKK" as by the combination of devices connecting the main water-gate shaft to the by-pass valve, to produce satisfactory governing. It is true that if you eliminate the part "M" entirely, the water-gate will operate without operating the by-pass valve, just exactly the same as if you eliminate pulleys 58, 57, etc., and ropes, that you will operate the main gate without operating the by-pass valve. If you put the matter as you did in one of your questions, leave out the device "M", but solidly connect the by-pass valve with the arm "N", you are not doing



the same as eliminating the clutch 58, ropes, etc., but it would correspond to directly connecting the motion of the water-gate with the by-pass valve. In other words, the result is exactly the same in the two cases, namely, Lyndon patent in suit and "Complainant's Exhibit KKK". You cannot take everything out of your Lyndon patent in suit and compare it with the condition when you substitute a solid rod for the device "M" in "Complainant's Exhibit KKK".

RXQ. 994. But if you take out all of the parts mentioned by number in the immediately preceding question from the device of the Lyndon patent in suit, you have no means for connecting the water-gate-operating shaft with the stem 49 of the by-pass valve, have you?

A. That is a self-evident fact.

MR. BLAKESLEE: Let it be noted that this question does not correctly repeat the former testimony which is purported to be repeated, inasmuch as the former question assumed the removal also of the stem 49 of the by-pass valve, and the record will so show.

MR. WESTALL: Counsel's suggestion is correct; the witness did include the valve stem 49 as being the equivalent of the parts included under the designation "M" on "Complainant's Exhibit KKK".

MR. BLAKESLEE: That is not the proposition. The proposition is that counsel included the valve stem 49 in the question which he asked in considering elimination of parts. Now, he is basing his question upon that question without such elimination, which is manifestly not a proper quotation of the witness's testimony.

RXQ. 995. (By MR. WESTALL:) You have stated

that you visited the Bakersfield plant, or, rather, the plant of the Power Development Company, and were to some extent familiar with the tests as to the efficiency of the wheels. All the information that you have gained regarding the efficiency or lack of efficiency of said water-wheel was merely hearsay, was it not?

MR. BLAKESLEE: Objected to as merely argumentative and calling for a conclusion on the part of the witness; not proper cross-examination, not the proper method of proof, and not in accordance with the testimony of the witness.

A. It was merely hearsay except that which was due to what I saw, and my personal observation while at the plant.

RXQ. 996. (By MR. WESTALL:) You did not see anything at that time which would enable you to form any accurate or intelligent opinion as to the efficiencies of those wheels without the information that you derived from hearsay, did you?

MR. BLAKESLEE: The same objections.

A. No, sir, I did not.

MR. WESTALL: That is all.

#### FURTHER REDIRECT EXAMINATION.

RDQ. 997. (By MR. BLAKESLEE:) Is it or is not true that if you took out the features designated as "M" in "Complainant's Exhibit KKK" you would destroy the function of the apparatus whereby the slow return of the by-pass valve to a usual position is caused, after the main governing action?

A. Yes.

RDQ. 998. And would have to substitute something in place thereof if you intended to move the by-pass valve at all; and that the same is true if you took out what you have referred to as the equivalent features in "Complainant's Exhibit A", including the weights 70, and desired to connect up the by-pass valve in "Complainant's Exhibit A" with the shaft 20, to cause the operation of the by-pass valve?

A. Yes, sir.

RDQ. 999. After the clutch members 57 and 58 of "Complainant's Exhibit A" have been relatively separated, do they enter into any action causing the return of the by-pass valve to usual position?

A. They do not.

RDQ. 1000. What is it that applies the power that causes the return of the by-pass valve to usual position in the Lyndon patent?

A. Weights.

RDQ. 1001. How are they numbered?

A. 70, 70.

RDQ. 1002. And further, in your comparison of the parts of the means for returning the by-pass valve to usual position in complainant's exhibit A with the usual means for returning the by-pass valve to usual position in complainant's exhibit KKK, what is it, of the group of features M in the latter exhibit that specifically corresponds with the weights 70, 70, in the former exhibit, if anything?

A. The inversely wound spiral springs.

RDQ. 1003. Are we to understand you as meaning that the returning device of complainant's exhibit KKK

stops directly at the end of the cylinder which contains the piston of the parts marked "E", reading from left to right of that drawing?

A. No, sir, there must be some means of communicating, as I testified, the rotary motion to the reciprocating motion of either the piston rod within the cylinder, or the cylinder, itself.

RDQ. 1004. What is done by this clutch connection of the returning device, with respect to the part marked "F" at the top of the drawing in "Complainant's Exhibit KKK"?

A. The part marked "F" is essentially the device for transmitting reciprocating motion to the part "E".

RDQ. 1005. And through the agency of what part does that part "F" operate?

A. It acts through the agency of a pinion.

RDQ. 1006. What I mean is, what imparts motion to this part co-acting with the pinion?

A. The fly-balls governor.

RDQ. 1007. What, if any, effect upon this pinion is produced through the clutch-connection "E"?

A. It is rotated.

RDQ. 1008. And what is used to rotate the pinion?

A. A rack.

RDQ. 1009. And what moves the rack?

A. The pinion of the device "E".

RDQ. 1010. And from what part does the device "E" obtain its motion?

A. It obtains it from the rack, presumably, marked "F".

RDQ. 1011. You have stated that the part "F", or the rack thereof, is moved to rotate the pinion, and you



have stated that the clutch connection "E" is connected with that rack. In what sense is that clutch connection a clutch connection in such relation?

A. It is a clutch connection in the sense that while motion may be given to the part of the device "E" which is known as the cylinders, that motion is not necessarily at an equal rate transmitted to the piston within, or vice versa.

RDQ. 1012. Will you state what effect the fly-balls have upon the stem which carries the pinion which is meshed with the rack of the part "F"?

A. The fly-balls have the connection that when they are raised or lowered through the spiral thread connected with the pinion, the pinion will be slightly rotated.

RDQ. 1013. What is the nature of the movement of the stem of this pinion which causes the movement of the piston valve in the controller cylinder?

A. It is a slight rotation of the pinion.

RDQ. 1014. I am referring now to the piston valve in the controller cylinder?

A. I beg your pardon. It is a vertical motion.

RDQ. 1015. Where does it get that vertical motion.

A. It gets it from the thread in the upper end of the stem.

RDQ. 1016. Does that vertical motion also include the pinion on that stem, or does it not?

A. That vertical motion does include the pinion on the stem, yes.

RDQ. 1017. If it were not for the part "E" and any effect it may have upon the rack of the part "F",

will you please state whether or not that pinion would receive any vertical movement at all?

A. It would not.

RDQ. 1018. Then where does the movement come from that is imparted to the rack through the clutch connection, or part "E"?

A. It comes from the bell crank "H" and the connecting rod "G".

RDQ. 1019. And that movement is a rectilinear movement, is it?

A. It is.

RDQ. 1020. That is imparted to the clutch connection "E"?

A. It is a rectilinear movement.

RDQ. 1021. When you get over to the pinion and find that rotated by the rack of the part "F", you have got what sort of movement in the pinion?

A. You have a movement of rotation.

RDQ. 1022. As to direction, or nature of movement, what has occurred, if anything, due to the modification or transformation thereof by the clutch "E"?

A. You have simply transformed reciprocating motion into the motion of rotation of the stem of the governor.

RDQ. 1023. And therefore, what have you to say as to the performance of this clutch connection "E", in the light of your definition of a clutch taken by itself, and its function of transforming movements?

A. It is a device for producing rotation of the stem in either direction, or having it remain still, as if it were not in contact at all.

RDQ. 1024. And when it does move it, what has the clutch done within your definition of clutches, taken by themselves?

A. It has simply connected a moving part so that it, for the time being, drives a driven part, and this method of driving is by rotation.

RDQ. 1025. And has it then, as a clutch, or has it not, converted rectilinear movement into rotary movement?

A. It has, as a clutch.

RDQ. 1026. Is it failing in any respect to perform the function of a clutch in so doing?

A. It is not.

RDQ. 1027. Now, with respect to the reversing clutch gear which you find the part "A" in "Complainant's Exhibit KKK" to be: Is the motion of the piston and piston rod therein, and of the body of oil behind that piston, connected through the agency of such piston rod, with any parts which oscillates or rotates?

A. Yes, sir.

RDQ. 1028. Therefore, what have you to say as to the nature of this reversing clutch gear as transforming in the manner of a clutch, one nature of motion to another?

A. It transforms, from a driven part, motion to a part which may be at rest, or may be moved in either one direction or another, the motion of the driven part being that of rotation, and serves definitely the function of a clutch.

RDQ. 1029. Is there any practical degree of difference as to incompressibility between the metallic substances of gear clutches and friction clutches, and the

oil used in the clutch connection "E" and the reversing clutch-gear "A" of "Complainant's Exhibit KKK"?

A. No, sir.

RDQ. 1030. Is it material whether you refer to the shaft "F", or the shaft adjacent to which appears the reference letter "J" in "Complainant's Exhibit KKK" as the water-gate-operating shaft?

A. No, I should not say so, inasmuch as they both are given a rotating motion by the same process and the same connecting devices.

RDQ. 1031. Then if you call the part "E" a clutch connection in "Complainant's Exhibit KKK", and you include the rack and its co-operating pinions of the part "F", as part of the returning device, which may likewise include such clutch-connection "E", as you have testified, is it or is it not proper to state that in part these elements coincide, and that the returning device in effect includes the clutch connection?

MR. WESTALL: Counsel for defendant at this time objects to this method of revamping the testimony of the witness given on his cross-examination. The witness has testified very positively, defining very carefully both the returning device and the clutch connection, and this method of examination is grossly leading and is intended to aid the witness in contradicting himself and in revamping testimony which has already been given by him.

MR. BLAKESLEE: The objections to the statements of counsel are made that they are in gross violation of Rule 51. Furthermore, the observation is made that there is such a thing as redirect examination, and



if counsel wishes to object to any specific question he has the liberty to do so. The testimony of a witness in response to redirect examination is as good testimony as in response to any other part of his testimony, as counsel must know.

MR. WESTALL: But, it is never proper for counsel to put words in the mouth of a witness, and to lead him by such questions, as is exemplified by the immediately preceding question.

MR. BLAKESLEE: I do not propose to take teaching as to that sort of thing, particularly when counsel for the defendant has, in his cross-examination, done very little else than testify himself.

A. I should so consider it.

RDQ. 1032. Is it essential, or is it not essential to the proper definition of a clutch, that such clutch connect operatively two elements or things for rotary motion thereof, or even for the conversion of direction of motion of one into a different direction of motion of the other.

MR. WESTALL: Objected to as leading.

A. The proper definition of a clutch is a device which may be, as desired, used to intermittently transmit motion from a moving part to a part which it is desired shall remain stationary or be put into motion either in the one direction or the other, in many cases by the operation of the clutch device, and it is not necessary that the character of motion should be transformed; it is quite immaterial whether the motion is transformed in direction and character, or not.

RDQ. 1033. (By MR. BLAKESLEE:) As a mat-

ter of fact, is the clutch completely a clutch and capable of performing a clutch function until or unless it is associated with, or disposed, or arranged for association with the part or parts which it is to unite for common or joint movement?

A. It is not.

MR. BLAKESLEE: That is all.

#### FURTHER RECROSS-EXAMINATION.

RXQ. 1034. (By MR. WESTALL:) Now, you have referred repeatedly on your cross-examination to a cylinder, a piston, a piston-rod, liquid within the cylinder, and probably the rod "G", as comprised within the designation "E" on "Complainant's Exhibit KKK", and you have stated that those parts were the equivalent of the "clutch connection" of Claim 3 of the Lyndon patent in suit, and also that they were the equivalent of the returning device mentioned in Claim 4 of said patent in suit. I will now ask you if you wish to add any part or element to the combination heretofore defined by you as coming under the designation "E" on said "Exhibit KKK" and as properly included under the designation of a clutch connection or returning device?

A. I should want to include what might be called a modification of the piston rod, whereby the reciprocating motion is converted into a rotary motion.

RXQ. 1035. Will you please mention the parts now which must be added to those which you have already defined?

A. The rack which is marked "F" at the top of "Complainant's Exhibit KKK", meshing with the pin-

ion which is not given any name; the combination being exactly and entirely in conformity with the corresponding description of the Lyndon patent, beginning with line 12 on page 2, "A returning device consisting of a "rod 25, connected by a pivoted link or connecting-rod "25a with a disk 22", and also taken in connection with line 104 on page 1 of the Lyndon patent, "A disk "22 is mounted on shaft 12, so as to be free to rotate, "but is held from endwise movement by collars, one of "which is shown at 22a. On the same shaft is a disk "23, normally out of contact with disk 22, but movable "endwise on said shaft into contact with said disk, the "disk" (referring to 23) "being caused to rotate with "the shaft by a spline connection 23a."

RXQ. 1036. So that you were mistaken when you pointed out the cylinder, its contents, consisting of the liquid therein, the piston and the piston rod and probably the rod "G", as comprising completely the clutch connection of claim 3, were you?

MR. BLAKESLEE: Objected to as merely uselessly argumentative and not cross-examination.

A. The items which you have mentioned in this question as a part of the device "E" would not, of itself, be the equivalent of a clutch, it being necessary, as I have repeatedly said, to have a device for converting the reciprocating motion in this case into a rotary motion; the entire matter being involved in what is understood to be included in the device "E".

RXQ. 1037. (By MR. WESTALL:) And "F" also?

A. Yes, "F" is necessary; "E" and "F" both will be necessary to perform the function of a clutch.

RXQ. 1038. So that you want to be understood as definitely and positively testifying now, no matter what your previous testimony might have been, that the combination of the cylinder casing, the liquid contained within the casing, the piston, the piston rod, probably the rod "G", the rack indicated by the letter "F" on "Complainant's Exhibit KKK", and the pinion upon said rack, unmarked, in combination constitute the equivalent of the "returning device" mentioned in Claim 4 of the patent in suit, and also the clutch connection mentioned in Claim 3 of the patent in suit? Is that correct?

A. That is correct.

RXQ. 1039. Now, do you wish to change your testimony in any respect regarding the parts included under the designation "M" on "Complainant's Exhibit KKK" by including any other element than the cylinder, the rod entering therein, the springs wound oppositely on each side, and the liquid within the cylinder?

MR. BLAKESLEE: Objected to as not in accordance with the testimony of the witness, - who also included in the definition of the group of elements "M" the connection of the cylinder with the needle valve, and also the means for putting springs under tension.

MR. WESTALL: Objected to as merely an attempt to coach the witness, and the record, it is submitted, speaks for itself.

MR. BLAKESLEE: If counsel thinks it proper to misstate in his question what the witness has testified to, it is more than proper than such misstatement be corrected.

A. I do not.



RXQ. 1040. (By MR. WESTALL:) And you do not wish to include either of the elements mentioned by counsel in his last examination, and in his last criticism of my question, do you?

A. I do not, because, as I have in my previous testimony indicated, myself, what is included in the letter "M", I have included the connection whereby the lever arm "N" is connected to the stem of the needle valve; and whatever may be enumerated as a part of that connection in that letter "M" I desire to have included. I would not want to be understood as saying that that is all included within the enumeration of segregated items as per your question.

RXQ. 1041. Then you mean that the enumeration that I have given you, namely, the cylinder, the rod entering therein, the springs wound oppositely on each side, the liquid within the cylinder, as previously testified to by you, is not complete, but you wish to add the connection whereby the lever-arm "N" is connected to the stem of the needle valve?

A. The items you have mentioned are essentially the entire contrivance designated by the letter "M".

RXQ. 1042. Then I take it you do not wish to add the connection mentioned in the last question?

A. Yes, because when I use the word "connection", I consider the connection as absolutely equivalent and all-embracing, of the device "M".

RXQ. 1043. You do not include, among any of the elements comprised within the designation "M" on "Complainant's Exhibit KKK", any means such as a rack, pinion, pulley, for converting direct motion into rotary?

A. No, sir, I do not.

RXQ. 1044. But the parts 57 and 58 shown in the drawings of the Lyndon patent in suit do communicate rotary motion, do they not?

MR. BLAKESLEE: Objected to as immaterial, irrelevant and incompetent, not proper cross-examination, the witness having already testified that these co-operating clutch parts have nothing to do whatsoever with the returning of the by-pass to usual position, and the testimony in this case being voluminous that those parts are used for the purpose of producing movement of the by-pass valve inversely to the water-wheel during governing, and that after these clutch parts have been disengaged the slow return of the by-pass takes place, irrespective of any function of such clutch members.

MR. WESTALL: Counsel's attention is called to the rule which prohibits argumentative objections.

A. They do.

RXQ. 1045. Do you desire to in any way change your former testimony by including as part of the clutch connection of Claim 3, or the returning device of Claim 4 of the Lyndon Patent in suit, any of the parts designated by "e" on "Complainant's Exhibit KKK?"

A. I think not; I do not.

RXQ. 1046. Nor any of the connections by which they are secured to the cylinder casing. Is that correct?

A. Yes, I should want to include everything except merely the actuating means, "e", which is moved in a vertical position by the reciprocating motion of the device "E".

MR. WESTALL: I believe that is all.

FURTHER REDIRECT EXAMINATION.

RDQ. 1047. (By MR. BLAKESLEE:) Is the specification and disclosure of "Complainant's Exhibit A", copy of Lyndon Patent in suit, positively limiting in its definition of the exact point at which the clutch connection part of the returning device terminates, and the other portions of the returning device commence?

MR. WESTALL: Objected to for the reason that the patent speaks for itself, and it calls for a matter of interpretation by the Court, rather than any question rightfully within the scope of an expert's examination.

MR. BLAKESLEE: We are now asking a question for which experts are welcomed by the Court, namely, a question pertaining to structures as disclosed in a patent.

A. It is not.

MR. BLAKESLEE: That is all.

MR. WESTALL: That is all of the cross-examination.

July 10, 1915. P. M.

*thereupon*

GEORGE J. HENRY, JR., the complainant, being recalled in rebuttal on his own behalf, testified as follows:

Q. 667. (By MR. BLAKESLEE:) You are the complainant, George J. Henry, Jr., in this present cause and action, are you?

A. I am.

Q. 668. Since you became possessed of the title to, or the right, title and interest in the Lyndon patent in suit, of which "Complainant's Exhibit A" is a copy, have you issued any licenses to any parties or persons

to make, use or sell apparatus for mechanism for water-wheel governors containing or to contain the invention, or any part thereof, covered by said Lyndon letters patent in suit?

MR. WESTALL: Objected to as immaterial, irrelevant and incompetent, and not proper rebuttal.

A. I have, since previously giving testimony in this case, issued such a license to the Pelton Water Wheel Company, and also to the Pacific Gas and Electric Company; the Pelton Water Wheel Company being the largest manufacturers of water wheel apparatus west of the Mississippi River, and the Pacific Gas and Electric Company being probably the largest hydro-electric corporation in the world.

Q. 669. (By MR. BLAKESLEE:) Are both of these parties located, as to their principal offices, in the state of California?

A. They are.

Q. 670. And has or has not each of these parties admitted the validity of the Lyndon patent in suit, in connection with the taking of such respective license?

A. They have fully admitted such validity, without restriction of any kind.

Q. 671. Can you produce any paper of license or license agreement attaching to the license of either or or both of these interests?

A. I can and do both produce both licenses which I testified to.

MR. WESTALL: The same objection is repeated to all this line of inquiry.

THE WITNESS: That of the Pelton Water Wheel



Company being dated January 23rd, 1915, and that with the Pacific Gas and Electric Company being dated the 3rd day of March, 1915, for my signature, and the 31st day of March, 1915, for that of the company.

Q. 672. (By MR. BLAKESLEE:) Will you please state whether all of the signatures appended to both of these instruments are known by you to be the signatures of the parties purporting to have placed the same upon these documents?

A. On the Pelton document, I was present and know the signatures of all the parties to be correct. On the license to the Pacific Gas and Electric Company I personally know, in addition to my signature, that of John A. Britton, Vice-President. Both these documents have the corporate seal of the respective company attached thereto.

Q. 673. Are or are not these license agreements in force at the present time?

A. They are; as far as I know the Pelton Company are conforming with the terms of their agreement.

MR. BLAKESLEE: I offer in evidence the two license agreements just produced by the witness, or true copies thereof, the originals being subject to production in Court upon the trial of this case, if required. Such offer being made respectively, as "Complainant's Exhibit Pelton Company License Agreement", and "Complainant's Exhibit Pacific Gas and Electric Company License Agreement", and ask that such copies thereof be so marked.

Q. 674. Will you please further state whether or not each of these license agreements was issued for a valuable consideration?

A. It was.

MR. WESTALL: If you provide copies, by giving me an opportunity to see whether they are correct, I will be willing to stipulate that the copies may be introduced in evidence with the same force and effect as the originals.

MR. BLAKESLEE: We don't care whether you do, or not.

MR. WESTALL: If you do not do that, then counsel for the defendant objects to the introduction of copies as not the best evidence, and also as irrelevant, incompetent and immaterial. I have no desire to enforce such objection, except that I do intend to have the right to know that these copies are the same as the originals. Therefore, I object to any copies being introduced in evidence in place of the originals, as not the best evidence.

MR. BLAKESLEE: Let the record show that counsel for defendant may now, or at any time hereafter, before the trial of this case, inspect the original copies of these agreements, which will be open to his inspection in the hands of the complainant in this case, so that he may compare them with the copies offered if he desires; and it is repeated that the originals will be produced if demanded, on the trial.

MR. WESTALL: I understand, then, that it is not the intention to offer the original documents in evidence which have been referred to and identified by the witness, but merely copies thereof.

MR. BLAKESLEE: The papers are of extreme value, and it is not desired to leave them in the custody

of any other person, and such is not necessary. They can be produced at the time of the trial, if necessary. We will ask that they both be marked for identification—that is, the original contracts,—by the reporter, as the original agreements referred to by the witness in his present testimony.

MR. WESTALL: Counsel for defendant will object to any marking by the reporter of the originals referred to, for identification, upon counsel's statement that he does not intend to offer said originals in evidence, but merely copies thereof. Counsel for defendant has heretofore indicated his willingness to stipulate such copies in evidence if they were produced within a reasonable time, and opportunity given to counsel for defendant to examine them, to determine their correctness as copies. But if no such opportunity is given until the time of the trial, counsel will then urge and object that such copies as may now be produced and marked are not the best evidence, and will object to the receipt in evidence at the time of the hearing, of any such originals, on the ground that the time for the taking of complainant's proofs in rebuttal will then have expired.

MR. BLAKESLEE: We have already offered counsel for defendant the opportunity to examine the originals at any time before the time of the trial, and he may thereupon compare them with the copies, and therefore, the terms of his stipulation offer are fully met with, and it is understood that the copies are stipulated to have full force and effect, as the originals would have.

MR. WESTALL: It is not proper or regular to thus attempt to throw the burden upon counsel for defend-

ant of seeking out counsel for complainant, or the complainant, and demanding the production of evidence which should be in the custody of the examiner to whom this case has been referred by stipulation, and, therefore, all objections and remarks heretofore made are repeated and insisted upon.

Q. 675. Included among, or in addition to the benefits or consideration passing to you from the Pelton Water Wheel Company in connection with the issuance of this license by you to it, did any actual cash consideration pass between it and yourself?

A. Yes, sir.

Q. 676. How much such actual cash?

A. \$15,000.

Q. 677. And has all of that been paid to you?

A. It has.

Q. 678. And when was it paid to you?

A. At the time the agreement was signed on January 23rd, 1915.

(The reporter marked the copies last above referred to by counsel for complainant, "Complainant's Exhibit Copy of Pelton Company License Agreement", and "Complainant's Exhibit, Copy of Pacific Gas & Electric Company License Agreement".

(The reporter here also marked the original of these last offered exhibits as follows:

"Original of Complainant's Exhibit, Copy of Pacific Gas and Electric Company License Agreement. Marked for Identification, July 10, 1915, J. L. Holland, representing Special Examiner in re Henry vs. City of Los Angeles, In Equity, No. A-87, U. S. Dist. Court, So. Dist. Cal. So. Div." and



“Original of Complainant’s Exhibit, Copy of Pelton Company License Agreement. Marked for Identification, July 10, 1915, J. L. Holland, representing Special Examiner in re Henry vs. City of Los Angeles, In Equity, No. A-87, U. S. Dist. Court, So. Dist. Cal. So. Div.”)

MR. WESTALL: Let the record show that while the reporter has marked the papers produced as stated by him in the immediately preceding paragraph of these proceedings, no copies of any such papers have been produced, and that therefore the reporter’s endorsement upon the purported originals has been made merely upon the suggestion of counsel for the complainant that they were originals of said purported copies, and not because of any independent examination or comparison made by the reporter, or possible to be made by the reporter at this time. This being the case, counsel for defendant again renews and repeats his objection either to the marking of said alleged original papers, as well as to the consideration in evidence of any purported copies which may be hereafter produced.

MR. BLAKESLEE: The copies are in evidence under a stipulation proposed by counsel for defendant, and the full terms of that stipulation will be abided by, namely, that he may examine the originals and compare them with the copies in evidence, at any time he wishes before the trial, and upon his signifying that he wishes so to do.

MR. WESTALL: Counsel has seen no copies, has had no opportunity of comparing copies, and neither has the reporter had any opportunity of comparing any

copies, and counsel for complainant expressly refused to enter into any such stipulation as has been suggested.

MR. BLAKESLEE: The record speaks for itself. Let the record show that the originals and copies are both before us at the present time, and counsel may examine them in compliance with the terms of his own offer of stipulation, as fully as he wishes, and the stipulation was entered into on his own proposition.

MR. WESTALL: This is the first notice that counsel for defendant has had that counsel for complainant wished to accept the stipulation extended to him, but, now that the originals and purported copies are produced, counsel will examine the same and determine whether or not they are true copies, and if so, even at this belated time, counsel for the defendant will still give counsel for complainant an opportunity to enter into the stipulation extended.

Counsel for defendant has examined the copies produced by the complainant, and seems to find them true copies, and will therefore stipulate that they may be received in evidence with the same force and effect as the originals, with the express understanding, however, that if it should be necessary at any time to demand production of the originals for further comparison, the original documents will be produced.

MR. BLAKESLEE: If counsel is not convinced that the stipulation is already of record, it will now be so considered.

Q. 679. Mr. Henry, are you able to produce any mechanical or electro-mechanical device or model which in any way embodies or sets forth operatively the in-

vention or teaching of Complainant's Exhibit A, Copy of Lyndon Patent in suit?

A. I am, and do.

(Witness produces a large model device.)

Q. 680. Will you please state the source of production of this model device, if you know?

A. I have had this model constructed for the purpose of showing the operativeness of many of the features and elements of the Lyndon invention. It has been produced under my direction.

Q. 681. Who did the actual work?

A. The work was done in my office by Mr. Cecil and myself.

Q. 682. Mr. Cecil is in your office, and what might be called your mechanical laboratory assistant?

A. Yes, sir.

Q. 683. Has any other person inspected the same since its completion?

A. Yes, several people have seen it. Professor Cory has gone over it very carefully.

Q. 684. The witness who just finished his testimony?

A. The witness who just testified.

Q. 685. Do you know whether he found it to be generally in accordance with, or to disclose the teachings of Complainant's Exhibit A, Copy of Lyndon Patent?

MR. WESTALL: Objected to as calling for not the best evidence, and calling for merely hearsay evidence. If it was intended to show what Mr. Cory thought of the device and how it operated, Mr. Cory should have been called as a witness.

MR. BLAKESLEE: We are not attempting to prove Mr. Cory's full knowledge of this exhibit model; we are simply attempting to show, and nothing more, that he examined it and in a general way approved of it.

A. Professor Cory examined it, and while, as I say, it was built under my direction, I may say that I adopted some of his suggestions in connection with it.

Q. 686. In planning and executing the construction of this model device, which you say was done under your supervision, what object did you have in view?

A. To be able to demonstrate to others the operative-ness of the Lyndon disclosure and structure, as I was convinced it would operate.

Q. 687. Are there missing from this model device any of the leading, essential or important features, parts or elements disclosed in Figure 1 of the drawing of Complainant's Exhibit A, and if so, what?

A. Yes, sir, there are missing from the Lyndon disclosures, set forth in figure 1 of Complainant's Exhibit A, the speed-sensitive dynamo; the solenoid, which is actuated by the dynamo; and, while the Lyndon device contemplates a water supply to the wheel, it is no essential part of figure 1, although the water supply is also missing from this model. It has been arranged, however, with an artificial method of rotating the water wheel and establishing a speed difference, and following the establishment of the speed difference, the model comes into operation to correct that speed difference by means identical with and arranged as nearly as one skilled in the art can do, in accordance with Lyndon disclosure, figure 1, Complainant's Exhibit A. It operates



both mechanically and electrically, and therefore is what might be termed electro-mechanical.

Q. 688. Is there anything provided in this model device to take the place of the core 34 of the solenoid 33, which is energized by the speed-sensitive dynamo 8 in complainant's exhibit A, figure 1?

A. Yes, the vertical rod, having a connection through a slot in the brass plate near the center and upper portion of the model, is the mechanical equivalent of the solenoid core, and is identical, as regards its movements, therewith.

Q. 689. And is there anything provided in this model device to simulate the performance of function of the speed sensitive dynamo 8?

A. Yes, the speed-sensitive dynamo 8 of Lyndon varies the voltage in the solenoid, and by so doing causes a displacement of the solenoid core. In the model before me, any variation in speed of the water wheel occasions a displacement of the vertical rod mentioned in my last answer as the equivalent and identical with the movements of the solenoid core, both as regards speed increase, or speed decrease, or speed return.

Q. 690. What is provided in this model device, if anything, as a prime mover for operating the element which corresponds to the water wheel?

A. An electric motor.

O. 691. And what is provided for the changes in position of the vertical rod which you say takes the place of the solenoid core?

A. A speed disturbance or variation in the water wheel speed, which would in practise be occasioned by a

variation in load on the driven machinery, such as an electric generator, is in the model occasioned by a shifting of the belt which drives the water wheel over cone pulleys, the shifting of this belt occasioning a variation in the water wheel speed, and simultaneously with the shifting of the belt, the movement of the equivalent of the solenoid core is occasioned through direct wire connection to the primary belt shifting means.

Q. 692. And in order to actuate and control the primary belt shifting means so as to produce artificially the variation of speed of the water wheel, and likewise to shift the substitute for the solenoid core, what have you provided, if anything, in this model device?

A. Wire connection to the belt shifting means, which gives the movement of the solenoid core upon a shifting of the primary belt. Following the movement of the solenoid core, I wish to be understood when I say solenoid core throughout my answers, as the vertical center rod which I have said is the equivalent of the solenoid core—following the movement of this solenoid core, there is occasioned movement by the governor, tending to re-establish the speed. This movement acts upon and causes the shifting of a secondary belt to compensate for the speed variation occasioned by the first belt, the secondary belt movement bringing the speed of the water wheel back to normal before it is overrun.

Q. 693. How is the shifting of the primary belt caused, if by any means, in this model device, to produce a simulation of disturbance of the speed of the water wheel, and simultaneously to move the vertical rod which takes the place of the solenoid core in "Complainant's Exhibit A"?

A. Through the rod, on which there is a screw thread and nut engaging therewith, to cause the shifting of the primary belt, this rod projecting from the back of the model through to the front just below the center, and having thereon a crank and handle, so that it may be turned from the front of the model, and the primary belt thus shifted to increase or decrease the water wheel speed.

Q. 694. Are we further to understand that after you have so accelerated or decelerated, artificially, the rotation of the water wheel, and caused an accompanying or responding movement of the vertical rod which simulates the solenoid core, correcting or governing action takes place which eventually restores the water wheel to its normal speed, and causes a return of the elements of the governor to their usual or normal positions?

A. Yes, sir.

Q. 695. And when this occurs, or during this occurrence, what occurs to the two belts which you have mentioned, and which jointly operate the water wheel?

A. The speed of the water wheel is occasioned by driving through two belts from a main pulley which receives its speed direct from an electric motor. The first of these belts runs over a pair of cone pulleys, and I have termed this the primary belt. The secondary belt is driven from the second cone pulley shaft, and drives to another cone pulley on the water-wheel shaft; so that if the primary belt be shifted to increase the water-wheel speed, the secondary belt may then be shifted to bring the speed back to normal. This arrangement is

made so that the primary belt may be shifted by hand to cause artificially a speed disturbance in the water-wheel shaft, which speed disturbance is at once detected by the governor, and the governor model is set into operation, and causes a shifting of the secondary belt to re-establish the speed at its correct point, and within the limits of the apparatus, corresponding with a speed variation of over fifty per cent, the governor performs all the functions in the same manner and by the same means and for the same purposes as in the Lyndon disclosure, "Complainant's Exhibit A".

Q. 696. As the secondary belt resumes its position to produce normal speed of the water-wheel, what occurs to the primary belt?

A. The primary belt remains in the same position that it was, the compensation having been effected by the secondary belt—a speed reduction occasioned by movement of the primary belt having been compensated for by a corresponding movement in the secondary belt, which has restored the speed, and vice versa.

Q. 697. And what returns the primary belt to its original position before it is artificially moved?

A. The crank in front of the model, as I have testified previously. In other words, any speed may be established on the water wheel by hand, and that speed will then be corrected by the governor moving the secondary belt.

Q. 698. Which movement is or is not independent of the artificial movement of the primary belt?

A. It is entirely independent and automatic.

Q. 699. Then am I right in stating that the water



wheel is at all times driven from the prime mover or electric motor, and that its speed only is artificially varied by means of the crank in front of the model?

A. Yes, sir; and, as an analogy, to make the model a little more readily understood, I might say that the electric motor is the equivalent of the water in the pipe line. The position of the primary belt corresponds with the degree of load. The position of the secondary belt corresponds with the degree of gate opening; so that when the load is changed on a generator being driven by a water-wheel, the shifting of the secondary belt in this device corresponds with the shifting of the water-wheel gates to compensate for such variation as has been occasioned by the load change.

Q. 700. And the belt assumes that position, are we to understand, which is proper in accordance with such change of load?

A. It does.

Q. 701. To the end that the wheel may operate at what speed?

A. The correction by the secondary belt is for the purpose of bringing the wheel back to its normal speed before it is overrun.

Q. 702. And as to the actions of the governor elements of this model device which so corrects the speed and so restores the secondary belt to its proper position for such corrected or constant speed, are those parts, or are they not, operated automatically in accordance with the general teaching of "Complainant's Exhibit A"?

A. They are.

Q. 703. I notice that you have provided in this model device two lights or glasses, respectively indicated "Speed too high", and "Speed too low". What is the purpose of those lights, and how are they used?

A. They are an addition to the model not shown in the Lyndon disclosure, and are for the purpose of making clear the fact that the speed is incorrect and is being corrected by the governor. The red light, which indicates when the speed of the water-wheel is too high, indicates that the red magnet is operating to cause the proper shifting of the gates to reduce the water quantity flowing to the water wheel, and therefore, to reduce the speed until proper speed has been reached. The green light on the other hand, indicating that the speed is too low, and that the water-wheel gates are opening for the purpose of adding a larger quantity of water to the water-wheel to increase the power, so as to bring the speed back to normal or correct speed.

Q. 704. I notice further that you have placed upon the front of this model device certain surfaces in blueprint, which bear mechanical and electro-mechanical figures or indications together with indicating characters. To what, if any, exhibit in the case do these several fragmentary surfaces relate?

A. They are cut from a blueprint copy of Complainant's Exhibit C, and are pasted upon different portions of this model to show more readily the identity of the several parts as set forth on Complainant's Exhibit C, and as set forth in figure 1 of the Lyndon patent in suit, "Complainant's Exhibit A".

Q. 705. And they are generally located respective-

ly adjacent to the features or groups of features which correspond to such showings, are they?

A. They are.

Q. 706. What does the group of parts consisting of the wheel and the wheel gates at the upper right hand corner of the front of the model device represent?

A. That represents a turbine water-wheel with a few of the balanced forms of water gates used for controlling the flow of water to the turbine wheel; these gates being connected by wire to the main water-wheel gate on the model so that they will move in synchronism therewith. There is also shown on the turbine casing in the upper right hand corner a butterfly valve, and its by-pass casing as attached to the feeder pipe to the turbine case. This by-pass butterfly valve also is connected by wires to work in synchronism with the main by-pass gate of the model so that the water gates and by-pass in this device shown in the upper right hand corner will operate synchronously with the water gate and by-pass of the model.

Q. 707. And where is that located?

A. It is located at the lower portion of the model structure.

Q. 708. And what is that group of parts in the extreme upper left hand corner of the front of the model device?

A. That is a working diagram of the by-pass needle nozzle as installed in the alleged infringing structures, and its water-gate and its by-pass valve are connected up to the water-gate and by-pass valve on the model in the same manner as the right hand turbine working diagram.

Q. 709. Are the parts of that last described group of elements likewise synchronously connected with the turbine representation just referred to?

A. Yes, both the turbine and the by-pass needle nozzle working diagrams are connected up to operate synchronously with the water gate and by-pass of the model structure, so that their operation may be examined.

Q. 710. And do or do not the water-gate and by-pass representations at the lower portion of the model device, and at the upper left hand portion of the model device conform in principle and otherwise generally with the corresponding features of complainant's exhibit KKK and other exhibits representative of the alleged infringing structures of defendant?

A. They do.

Q. 711. And does or does not the representation at the upper right hand corner of the model device accord generally with the by-pass and wheel casing and the wheel understood to be in the wheel casing, of figure 1 of Complainant's Exhibit A?

A. It does.

Q. 712. Will you please now throw into operation from the prime mover the water-wheel symbol at the lower left hand corner of the model device and operatively connect up the remaining features of the model device governor, and then put the model device into operation, and state what takes place first upon a change of speed of the water-wheel in acceleration, and then what takes place upon a change of speed of the water-wheel in deceleration?

A. I now put the water-wheel in operation by starting the electric motor previously referred to. I now



connect the apparatus electrically, and by turning the crank in the front of the model, I cause the primary belt—

Q. 713. (Interrupting). In which direction?

A. In a clock-wise direction; I cause the primary belt to accelerate the wheel speed. As I do this the red light is illuminated, indicating that the speed of the wheel is too high, and the red magnet No. 15 of the Lyndon Figure 1—and all of the figures which I give in this demonstration are to be considered as disclosed in the Lyndon figure 1 of Complainant's Exhibit A, and also correspond with the figures in Complainant's Exhibit C. The red magnet 15 sets into operation clutch 13, 13 A, causing the operation of the governor to correct the speed, when movement of the governor parts transmits movement to the water-gate. The water-gate is indicated by the needle in the upper nozzle outlet, and as the speed was too high, this gate or needle valve is moved in a closing direction to reduce the water flowing on to the wheel. At the same time, in the turbine diagram in the upper right hand corner, the turbine wicket gates, which are also a balanced form of gate, are shown to slightly close; and in the working diagram, in the left hand upper portion, the upper needle nozzle is shown to have its needle moving in a slightly closing direction. We will now again make the speed of the wheel too high, until a considerable movement in the gates occurs, so that their closure will be more apparent. As the governor is a very sensitive device, a very small speed disturbance will cause a movement of the gate, which is scarcely observable to the eye. The governor is still correcting the speed. The water-gates on the turbine

diagram in the upper right hand corner; the water-gate in the alleged infringing device diagram in the upper left hand corner, and the water-gate controlling the supply of water to the rotating water-wheel in the model, are all in their closed position now. This corresponds with the water wheel driving the apparatus at the correct speed, but with the smallest possible load. This is naturally one of the limits of the governor, as any further closure of the water-gate would stop the wheel, the load having been entirely rejected.

I will now operate the crank in a counter-clockwise direction, and thereby reduce the speed of the water-wheel. The governor will then operate to open the gates in the model and the two working diagrams. The green light indicates that the speed is too low. The water-gates are being opened to admit more water to drive the water-wheels. It will be noticed that the action of the governor lags behind the movement of the crank probably half a second. This is because the governor does not come into operation until the primary belt has actually been shifted by the crank. It also persists about half a second after I cease moving the crank, so as to carry the secondary belt up to the point of correct speed without overrunning.

We will now open these gates wide, corresponding with a full load condition on the wheel. The water-wheel gates are now wide open. At this stage of the proceedings the governor cuts itself out automatically through the operation of the parts 77, 78, 79, 83, 85 A, 85, 87 and 90, so that no damage can be occasioned to any of the working parts, as would be the result if it were permitted to move the gates beyond their upper or

open limit. There is, of course, a similar action takes place at the extreme closed position of the parts, so that they cannot be jammed or damaged by the governor over-acting.

I will now more quickly close the water-gates, and in so doing have opened the by-pass needle, which is seen to be considerably opened. The by-pass valve on the turbine valve is opened and the by-pass needle on the upper left hand diagram is opened. They are now slowly closing, under the action of the dashpot and spring—the dashpot and spring in this case being the equivalent of the dashpot and weights 69, 70. The by-pass is now closed—a period of probably fifteen seconds having elapsed. During the period of slow closure, the water velocity of the main pipe line has been slowly retarded. The rate of retardation of the water—that is, its gradually slowing up—is such as will prevent dangerous pressure rise or water-ram in the pipe line.

It will be noted that the by-pass valve on the model and in the two working diagrams are all shown in a closed position. This is the normal position as the model is now set. I am going to change the normal position of the by-pass valve on the model, and also on the two diagrams, by a single movement in each case.

The movement I speak of is shifting a small screw between the two springs on the by-pass valve rod at the bottom of the model device. The needle will now return to a middle or central position. The same applies to the butterfly by-pass as I have it adjusted on the upper right hand turbine diagram. The speed is now too high. The butterfly valve by-pass is seen to open to a greater

degree. The main nozzle is closed; the by-pass valve is off of its seat, having opened to correspond with the greater water flow, and it is now returning to a central, normal position. The same applies to the diagram in the upper left hand corner.

The object of this demonstration is to show the simplicity of adjustment of the by-pass valve normal position. I will now, by shifting the primary belt, show what takes place if the speed is too low, with the by-pass valve set in a central position as the normal position. The main gates are now opening; the by-pass valve is correspondingly closing. After the governor action has ceased, the by-pass valves will return to their new normal position, which is, as now adjusted, their central, or half-opened position. This is the position that is described more fully by Mr. Lyndon as it corresponds with the movement of the by-pass valve in both directions, and is applicable in every case. ~~There are, however, many cases where the movement of the by-pass valve in both directions, and is applicable in every case.~~ There are, however, many cases where the movement of the by-pass valve in an opening direction, after the gates have reached their final governed position, is not necessary, and this second movement is, therefore, not always used.

I will now, by removing the little screw in the by-pass valve rod from between the springs, and substituting a little taper pin, where the dashpot gland slides over the said rod, cause the by-pass valve to move synchronously without slow closure. There is no other adjustment necessary than the inserting of that pin. In order to take the strain off of the parts, however, it is advisable



to remove the little screw between the springs, so as to relieve the parts from the spring pressure, as long as the spring has no longer any function to perform with this new adjustment. The by-pass will now operate synchronously with the water-gate, but inversely thereto, the slow closure having been cut out by the insertion of this pin. The by-pass is now opened; the main gate is almost entirely closed. The water flow in the pipe is now constant; there being no slow closure of the by-pass, no retardation of the water will occur; the water which is not doing any work on the wheel is going through the by-pass, and will continue to do so, with this adjustment, until the governor is moved again. This adjustment on the device is used in many installations, but probably not as many as that in which the slow closure is used, as the slow closure of the by-pass device has the great advantage of saving water.

The by-pass is now half opened, and the water-gate is half opened. One-half of the water is being discharged without contact with the wheel, and the other half is being used for power, the governor having occasioned this accomplishment when I artificially varied the water-wheel speed by shifting the primary belt as before.

Q. 714. Will you please refer briefly to the operation in this model device of what is referred to in the Lyndon patent, as per Complainant's Exhibit A, as the returning device provided with the clutch connection including the clutch members 22 and 23?

A. This element of the device is shown just to the right over the centre of the water wheel, and consists of two circular plates actuated by the pair of horizontal magnets. These come into action through contacts 45,

46, 45 A and 46 A, whenever a speed disturbance occurs, in order to form a clutch connection to the water-gate-operating shaft, or the shaft which operates the water-gate-operating shaft, and runs in synchronism with it, and for the purpose of producing the necessary returning action or pressure against the lever 26, which, through the mercury contacts 40, 40 A and 41 A, set up the actuation of the magnet 15 or 16, and cause the interruption of such magnet and associated clutch operation before the water-wheel speed is overrun. It will be noticed that no seesawing occurs, or hunting of the speed, as one or the other of the magnets comes into operation whenever I shift the hand control, and operate until the speed is corrected, without the speed running beyond normal, making the governor stable and positive in its action without oscillation at the speed. If there were an oscillation in the speed, this would be indicated by first, the red, and then the green light, being illuminated a number of times following the effort on the part of the governor to correct the speed disturbance set up by the shifting of the primary belt.

Q. 715. Is it possible in the operation of this model device, in operating the crank at the front of the model device in a constant direction, so as to produce either too high a speed or too low a speed of the water-wheel artificially, and likewise, is it possible in the resultant action of the governor, to obtain any such alternate illumination of the red and green lights which would unfailingly as you say, show such hunting of the governor or oscillation of wheel speed, or imperfect correction of wheel speed?

A. I think the governor responds too quickly to en-

able any such result to be accomplished artificially by the hand control of the crank. I will try it.

MR. BLAKESLEE: (To the reporter) Read the question.

(The reporter reads the question.)

Q. 716. What did you do? Reverse the crank?

A. Yes.

Q. 717. I simply asked you to operate it in a constant direction.

A. Two distinct governor movements take place.

MR. BLAKESLEE: I did not want that. Read the question.

(The reporter reads Question No. 715).

A. No, sir, it is not.

MR. BLAKESLEE: Complainant offers in evidence the model device last produced and thereupon demonstrated by the witness, complainant, in connection with his testimony pertinent thereto, as "Complainant's Exhibit Operating Model of Invention Disclosed by Complainant's Exhibit A, Copy of Lyndon Patent in suit," and ask that the same be so marked.

MR. WESTALL: Counsel for defendant objects to the introduction of the model on the ground that it does not correctly exemplify the construction of the Lyndon patent in suit; that it is not made accurately to correspond with the features of said patent, nor is it made to operate as is claimed, or as is described in the Lyndon patent in suit; therefore, that it is incompetent evidence for any purpose which has been suggested by the witness or counsel.

MR. BLAKESLEE: Q. 718. Referring to Com-

plainant's Copy of Pacific Gas and Electric Company License Agreement, what, if any consideration passed as between yourself and the licensee thereof for such license, <sup>and</sup> in what manner did it pass?

A. The agreement with the Pacific Gas and Electric Company was the validity of a large number of patents as set forth in the license; that was the principal consideration.

Q. 719. In what way, as appears on its face, was it pursuant to agreement with money consideration between the Pelton Water Wheel Company and yourself?

A. I had agreed with the Pelton Water Wheel Company to release certain apparatus furnished by them in exchange for the agreement of the validity of a large number of patents as set forth in the agreement, and an agreement by them to return to me any rights to license users under this large list of patents, they previously having had a right to so license.

Q. 720. Under such list of patents?

A. Under such patents as appeared in such list.

Q. 721. And what money consideration is referred to in the agreement, in this license agreement?

A. That refers primarily to the money consideration between the Pelton Water Wheel Company and myself, \$15,000.

Q. 722. That was paid to you as you have testified?

A. Yes, sir.

Q. 723. Do you place a small or large value upon the right conveyed by the Pelton Water Wheel Company to you to license, under the list of patents in this Pacific Gas and Electric Company agreement?



A. I place a very large value on it.

MR. BLAKESLEE: Counsel may cross-examine.

CROSS-EXAMINATION.

XQ. 724. (By MR. WESTALL:) Do I understand that you received \$15,000 from the Pelton Water Wheel Company in exchange for a license under the Lyndon patent in suit, as well as a great many other patents?

A. No, sir, quite the contrary. I received \$15,000 and the exclusive right to license under a very large number of patents from the Pelton Water Wheel Company, for a license under the Lyndon patent.

XQ. 725. (By MR. BLAKESLEE:) To them, you mean?

A. To them; and to hold them harmless for patent infringement.

XQ. 726. (By MR. WESTALL:) Did the Pelton Water Wheel Company receive any other consideration for the license under the Lyndon patent in suit, from you, for their \$15,000?

A. Yes, they received some capital stock in the Pelton Water Wheel Company which I had previously owned.

XQ. 727. How much capital stock did they receive?

A. 1005 shares.

XQ. 728. What was the value of that 1005 shares?

A. I don't know; I could not get an offer of \$1000 for it from anybody else; I could not borrow a thousand dollars on it.

XQ. 729. What other consideration passed from you to the Pelton Water Wheel Company besides the stock that you have spoken of and the license?

A. I don't think of any other at the moment. The contract is in evidence.

XQ. 730. Were there other claims or rights of any kind against the Pelton Water Wheel Company that you relinquished in consideration of that \$15,000?

MR. BLAKESLEE: I object to further cross-examination along this line, although we have nothing to disguise or to secrete, inasmuch as it has become improper cross-examination, and the best evidence is the license agreement itself, a copy of which is stipulated in evidence.

A. There was, yes, there was an agreement on my part to license them under any patents that might be issued on pending applications at that time for letters patent applied for by me, and I did have at that time in the Patent Office, applications for three patents, in which the Pelton Water Wheel Company always contended they had a half interest.

XQ. 731. (By MR. WESTALL:) Was there any other litigation contemplated or pending between you and the Pelton Water Wheel Company which was adjusted by the passing of this \$15,000 that you have spoken of?

A. Yes, sir, the Pelton Water Wheel Company had been sued by me after they intervened in this suit; I entered suit against them here under the Lyndon patent, and the licensing of them under the Lyndon patent, automatically killed that suit.

XQ. 732. And was there any other suit?

A. They were intervenors in this suit, and that, by their taking a license, automatically compelled their withdrawal.

XQ. 733. Besides any litigation contemplated or pending regarding the Lyndon patent in suit, were there any other claims or litigation which was settled up between the Pelton Water Wheel Company and yourself, by the passing of that \$15,000?

MR. BLAKESLEE: The last objection will be understood as being repeated, this not being cross-examination, and inasmuch as the contract itself is the best evidence, and verbal testimony as to the contents thereof is not the best evidence.

A. No, sir.

XQ. 734. (By MR. WESTALL:) The question is not directed at the contents of the purported agreement, but it is directed to bringing out the facts of the actual transaction which may not fully appear in the agreement.

A. No, sir.

MR. BLAKESLEE: The transaction has been reduced to a convention in writing, which speaks for itself, and such testimony is not admissible on cross-examination.

XQ. 735. (By MR. WESTALL:) Were there any other verbal agreements or written agreements of any kind entered into between you and the Pelton Water Wheel Company at or about the time of the signing of this agreement, a copy of which has been offered in evidence, and concerning the subject matter of the adjustment of your rights, claims or disputes with the Pelton Water Wheel Company?

A. The question is entirely too broad for me to give you a positive answer. It is a fact that for a period of

I think sixty days before that agreement there were several dozen verbal agreements, if I understand what a verbal agreement is, all of which were eventually reduced to writing, some of which were canceled, some of which were embodied in this agreement, some of which were abrogated. I could not, to save my soul, at the present moment answer your question specifically other than to say, that, as I recollect it now, the written agreement in evidence covers the agreement.

MR. BLAKESLEE: I will interpose a question here.

XQ. 736. Is there any outstanding agreement between yourself and the Pelton Water Wheel Company at the present date other than that reflected in this license agreement?

A. No, sir.

XQ. 737. (By MR. WESTALL:) And were there any agreements, verbal, or in writing, which were not produced by you, concerning the subject matter of this license under the patent in suit?

A. No, sir, I don't believe there were; I have no recollection of any.

XQ. 738. Do you think there may have been other agreements between you which had to do with the subject-matter of the agreement produced in evidence, which you have not produced?

A. Yes, I think there were; come to think of it, now that you have reminded me, I remember that I had a good deal of correspondence with Mr. Blakeslee, and in the early days of this suit I remember there was some correspondence between Mr. Blakeslee and myself that had to do with his dealings with the Pelton Water Wheel



Company as my representative, and I don't think those have ever been put into evidence, although I think certain letters between Mr. Blakeslee and the Pelton Company and Blakeslee and the Board of Public Works of Los Angeles, in which the Pelton Company were involved, were put in. My letters to him were not.

MR. BLAKESLEE: I move that the answer be stricken out and withheld from consideration. Apparently, it involved merely those relations which existed between the witness and his attorney, and did not relate to any agreement existing as between the witness and the Pelton Water Wheel Company.

XQ. 739. (By MR. WESTALL:) Does your license agreement with the Pelton Water Wheel Company which has been produced in evidence correctly and completely state all the considerations that passed between yourself and the Pelton Water Wheel Company, and which supports said agreement, or were there other considerations which do not appear in said license agreement, and which either rest in a verbal understanding between you and the Pelton Company, or upon some written agreement which you have not yet produced in evidence?

A. Yes, there was one other consideration that entered into the signing of that agreement by me, and that was a feeling of loyalty to the old Pelton Water Wheel Company that I worked with eighteen years, and to save my soul I cannot seem to rid myself of it, much to my regret. I felt, in entering into that agreement, that there was a moral obligation on my part to treat the Pelton Water Wheel Company better than I believe they deserved. That was a very large factor.

MR. BLAKESLEE: You had better answer the question, was there anything else outside that is not in the agreement? Any other agreement?

A. That is the only thing that I think of that I have not mentioned, that is outside of the agreement, that was a consideration.

XQ. 740. (By MR. WESTALL:) So that all the considerations beyond the one you have mentioned are contained in that agreement?

A. Yes, sir.

XQ. 741. Referring now to model "Complainant's Exhibit Operating Model of Invention Disclosed by Complainant's Exhibit A, Copy of Lyndon Patent in suit," I will ask you if it is not a fact that in said model you have not illustrated a dynamo 8, would as described in the patent in suit, and having the peculiar characteristics of such dynamo as therein described?

MR. BLAKESLEE: Objected to as calling for repetition of testimony directly given by the witness himself to a previous question.

A. I have already stated that no such dynamo is present in the model, and that the equivalent result of shifting the solenoid core 34 and its associated parts 35, etc., is accomplished by mechanically shifting the primary belt. It is impossible, in any model that could be placed in this building, much less in this room, to reproduce an operating pipe-line and water wheel and dynamo for drivinog a complete water wheel equipment.

XQ. 742. (By MR. WESTALL:) It would not be impossible to make a small model exactly and correctly exemplifying the construction of Figure 1 of the Lyndon

patent in suit, but in which the water wheel was operated by hand, would it?

A. It would be very difficult, yes, it would be impossible on any small device to operate such a dynamo as a speed-sensitive device. The dynamo itself is a very cheap and simple article, and can be bought in the open market, but to operate it as a speed-sensitive device through its voltage variation requires a dynamo of considerable size driven by the water-wheel.

XQ. 743. So that you cannot illustrate, and you have not attempted to illustrate in this model, the use and effect of such a dynamo?

A. I have attempted to illustrate, and I believe I have correctly so illustrated, and witness Cobb and witness Berry and witness Cory, and I think others, have testified that the speed-sensitive dynamo is a perfectly operative device, and would accomplish the shifting of the solenoid core as claimed by Lyndon. The testimony in this case is so voluminous as to the operation of the devices of the Lyndon patent up to the solenoid core that I did not see how any question could exist in regard to their satisfactory operation as a speed-sensitive and governor-controlling means. And, I may add, that the battery connections operating the magnet and through the contacts are from an electrical source consisting of a storage battery which is the mechanical equivalent, as regards supply of current from the dynamo, in Lyndon Figure 1. The storage battery is in plain sight on the floor at the base of the instrument. That much of the dynamo 8 of Lyndon Figure 1 is in operative connection in the model.

XQ. 744. In the Lyndon patent in suit, however, the

different magnets are energized by the dynamo 8, are they not, which you have left out of your model?

A. Yes; in this model they are energized by a storage battery, a well-known source of electricity, and equivalent in every respect, as far as a source of energy for any of the magnets concerned.

XQ. 745. I notice also in said model that you do not show the operation of a butterfly valve by the clutch mechanism illustrated in the patent in suit, or by the weights and sheave-wheel. Will you please explain why you did not use the precise construction shown in the patent in suit in those respects?

A. You are in error in regard to everything except the weight. For the weight I have substituted a spring, which is certainly a well-known equivalent, acts in the same way and accomplishes the same result identically. The butterfly valve, as I previously testified, is in the upper right-hand corner; it is connected over sheave wheels to the operating rods, and connections on the bottom of the model, and by gears from them up to the clutch operated by the compensating yellow magnets, which is the Lyndon clutch 57, 58.

#### REDIRECT EXAMINATION.

RDQ. 746. (By MR. BLAKESLEE:) Is it or is it not true that there were certain possible outstanding claims of infringement as against you in favor of the Pelton Water Wheel Company, which are also waived, or were waived pursuant to the license agreement in evidence?

A. I though I had so stated; if I did not, it was my



error, because that was one of the considerations passing from the Pelton Company to me, that on any and all apparatus which I had constructed theretofore, I was to be held harmless under any or all patents owned or controlled by the Pelton Water Wheel Company, of which there were a very large number.

RDQ. 747. Is or is it not true that my letters which you have referred to to the Board of Public Works and to the Pelton Company relate to infringement of the patent in this suit?

A. They did.

RE-CROSS-EXAMINATION.

RXQ. 748. (By MR. WESTALL:) I notice appended to this copy of this agreement with the Pelton Water Wheel Company, dated January 23rd, 1915, the name of William A. Doble. Will you please state who Mr. Doble is?

A. Mr. Doble is the chief engineer of the Pelton Water Wheel Company.

RXQ. 749. How long has he been chief engineer of the Pelton Water Wheel Company?

A. Since about two months after I left the position of chief engineer in the Pelton Water Wheel Company, they engaged Mr. Doble. I don't know whether it was one month, or two months. It was about three years ago.

RXQ. 750. In what business was Mr. Doble before he became connected with the Pelton Water Wheel Company?

MR. BLAKESLEE: Objected to as not recross-examination, and as immaterial.

A. I can't say positively, but I don't believe he was in any business for a while. The old Abner Doble Company had been in the hands of its creditors for a very considerable period of time, and whether Mr. Doble was officially doing anything, I cannot say.

RXQ. 751. (By MR. WESTALL:) What was Mr. Doble's connection with the old Abner Doble Company to which you have referred?

A. I believe he was the man that eased their downfall as president.

RXQ. 752. Do you understand that this Abner Doble Company was the company that furnished this apparatus used at one or both of the plants which are claimed to be infringement upon the Lyndon patent in suit?

MR. BLAKESLEE: Objected to as not recross-examination.

A. It is my understanding that the Abner Doble Company furnished the hydraulic apparatus for the Division plant on the Los Angeles aqueduct, and also one of the units in the Cottonwood plant.

RXQ. 753. (By MR. WESTALL:) Being the two plants—

A. Being the two plants in which we have particularly alleged infringement.

RXQ. 754. And at the time of furnishing that apparatus do you understand that Mr. William Doble was connected with the Abner Doble Company?

MR. BLAKESLEE: The same objection.

A. He was so connected.

RXQ. 755. (By MR. WESTALL:) And this is the same William A. Doble who signed this agreement?

MR. BLAKESLEE: I object to any such implication, that he signed the agreement.—

A. That is the same Mr. Doble.

MR. BLAKESLEE: Further than as appears as an addendum to the copy of the agreement in which Doble admits the validity of the patent in this suit.

A. That is the same Mr. Doble.

MR. WESTALL: That is all.

MR. BLAKESLEE: This concludes the rebuttal procedure on behalf of complainant in this case, and the taking of testimony under the stipulations between the parties and under the orders of the Court being now closed, the case will be set for final hearing as the Court shall direct. And the reporter is instructed to return to the Special Examiner the transcript of the record taken by him, and deliver a copy of same to counsel for each party to the suit, and to return the exhibits offered during his service as reporter to the Special Examiner, for marking, certifying and filing; and all pursuant to the stipulations between the parties and orders of Court.

*Letter omitted.*

CORRECTIONS.

“In reviewing the testimony given by me recently in

2515 21 “Pursuant to letter signed by C. L. Cory, the witness giving the foregoing deposition, said letter being addressed to me as Special Examiner, and dated August 3, 1915, I hereby incorporate the following:”

‘Cancel the words “of the pipe line” in the 5th line of answer to XQ 729 as it appears on page 2078 of the record.

‘Cancel “supported” and substitute “provided” in

2nd line of answer to XQ 744 as it appears on page 2083 of the record.

'Cancel the word "not" in 4th line of answer to RXQ 952 appearing in line 23 of page 2169 of the record.

"And further additions to my testimony as follows:

'When testifying in answer to questions XQ 856-857-858-859-et seq. I had in mind that the use of the word device in XQ 856 referred to the by-pass device instead of the entire governor device.

'I do not wish to be understood as testifying that the water wheel gates could not open wider even if normally the by-pass valve should be closed, for it is evident from Complainant's Exhibit A that the by-pass valve could accommodate further opening movement of the water wheel gates, by slippage between the parts of the clutch controlling the operation of the by-pass valve, or by some other suitable equivalent yielding relation, such for instance as furnished by the cylinder, within which the piston moves in Complainant's Exhibit KKK, namely the cylinder which operates the by-pass needle valve. Or, the mercury cups of the contact device controlling the energization of the electro-magnet which in turn controls the clutch device of the by-pass valve of Complainant's Exhibit A, could be so depleted of mercury or so adjusted that no attempted actuation of the by-pass valve would take place in an opening movement of the water wheel gates, but only in a closing movement of the water wheel gates adjusting the contacts and allied parts as might be necessary to that end. This is clearly contemplated in the disclosure of Complainant's Exhibit A. In this connection I wish to state further that the subject of Complainant's Exhibit A, as disclosed by the specification and drawing thereof, is clearly operative in this respect and in all other respects; there being no part or element of the construction, the operation of which would not definitely and positively result from following the teachings of Com-



plainant's Exhibit A, copy of the Lyndon patent in suit.

Also :

'I do not wish to be understood in any of my testimony and particularly in answer to questions RXQ 953-963-971, that a clutch must convert one form of motion to another. Two shafts may be clutched together, such that rotation of one imparts rotation to another and the same is equally true of rectilinear motion, or any other motion. A clutch is really a means of operatively connecting and of disconnecting a driven part with a driving part. Thus the hand clutches to impart bodily motion to the object clutched. The clutch, broadly speaking, therefore, transmits movements or an impulse from one thing to another so as to cause it to do something under the direction of the first, and this clutch action may be terminated by the actuation of elements of the clutch or by terminating or limiting the movement of the driving part or of the driven part, the clutch remaining in the latter case in a position to work again as soon as the moving part or actuating part performs its duty.

A clutch may also vary the rate of movement transmitted between the driving and driven parts, indeed this latter is one of its most frequent applications in mechanics.

Also :

'I wish to be understood in my answers to Questions 1045 and 1046, that the means "E" are provided with the means "e", which cause proper operation thereof, serving in effect to connect up the clutch connection of the returning device with the operating shaft. In this sense the means "e" is to be included as a part of the clutch connection of claim 3 or the returning device of claim 4 of the Lyndon patent in suit, as the returning device, of course, broadly includes the clutch connection. "e" actuates the clutch connection and is actuated by said controller.' "

*I Benjamin*

IN THE UNITED STATES DISTRICT COURT,  
SOUTHERN DISTRICT, CALIFORNIA,  
SOUTHERN DIVISION.

GEORGE J. HENRY, JR.,  
Complainant.

vs.

CITY OF LOS ANGELES,  
Defendant.

In Equity, No. A-87.

Proceedings taken on behalf of the Complainant in rebuttal, pursuant to stipulations between the parties and orders of Court, all of record, such stipulations including notice of these proceedings, before Grace M. Drayer, Notary Public and Reporter, at the City of York, County of York, Pennsylvania, May 21st, 1915. These proceedings were originally stipulated to commence at the hour of 10 A. M. on this day and are continued from that hour until the hour of 2 o'clock P. M., at the office of the York Manufacturing Company.

PRESENT: Raymond Ives Blakeslee, solicitor and counsel for Complainant, and Joseph F. Westall, Esq., solicitor and of counsel for Defendant.

Whereupon the following proceedings were had.

THOMAS SHIPLEY, ESQ., a witness called on behalf of the Complainant, being duly sworn, testifies as follows in answer to interrogatories put by Mr. Blakeslee:

1. Q. Please state your full name, age, residence and occupation.

A. Thomas Shipley, aged fifty-three; Vice-President

and General Manager of the York Manufacturing Company, manufacturing refrigerating machinery.

2. Q. Resident of York, Pennsylvania?

A. Yes, sir.

3. Q. How long have you been connected with that Company?

A. Seventeen and a half years.

4. Q. And has your official connection always been the same?

A. It has.

5. Q. Are you acquainted with one Lamar Lyndon, of New York City, a consulting engineer?

A. I am.

6. Q. How long have you known Mr. Lyndon?

A. Sixteen, seventeen years.

7. Q. Do you remember when and where you first met him, and under what circumstances, and if so, please state.

A. I met him in connection with business we did with the American Trading Company of New York.

8. Q. Did Mr. Lyndon have any connection with that Company at that time?

A. He was chief engineer of that Company.

9. Q. About when was that?

A. That was in 1898.

10. Q. Did you at that time have a representative in the City of New York?

A. We did.

11. Q. Who was he?

A. David S. Hays & Company, that was our representative.

12. Q. Who was the head of that?

A. David S. Hays.

13. Q. Do you know where he is now?

A. To the best of my knowledge, he is still in New York under the name of David S. Hays.

14. Q. How long was he at the head of that agency in New York in representation of your interests?

A. I believe it was about five years.

15. Q. Did you ever have any dealings with Mr. Lyndon directly concerning any matter not that of the American Trading Company?

A. I did.

16. Q. What was the general nature of that transaction?

A. It was in connection with the development of an invention, a water-wheel governor, which he had gotten up.

17. Q. Can you state approximately when you first took up this matter with Mr. Lyndon?

A. The first part of the year of 1899.

18. Q. Please state briefly what you did in that connection in the early part of 1899.

A. I had an interview with Mr. Lyndon on the subject and it was agreed, in behalf of the York Manufacturing Company, to take up the development and patenting of his invention for a percentage of profit and ownership of the patent.

19. Q. Do you know whether that agreement was ever reduced to formal writing?

A. I believe it was in the form of a letter only, not an instrument of any kind.



20. Q. Did Mr. Hays have anything to do with that transaction?

A. He was our intermediary in the general preliminary details.

21. Q. Did any correspondence pass between yourself and Mr. Hays in this connection?

A. Yes, sir.

22. Q. And was there further correspondence with Mr. Lyndon about this matter after the opening letters?

A. There was.

23. Q. Can you produce any letters which passed between Mr. Lyndon and Mr. Hays and yourself or the York Manufacturing Company in connection with that water-wheel governor matter?

A. Yes sir.

Witness produces seven letters purporting to be signed by Lamar Lyndon and to have been written to Thomas Shipley, Esq., or one Shipley, or the York Manufacturing Company, bearing dates of March 27, 1899, June 7, 1899, July 21, 1899, July 24, 1899, August 30, 1899, January 8, 1900, January 13, 1900 and June 14, 1900 respectively.

24. Q. I will ask you if you received each of these letters in due course of mail, in the usual order of your business?

A. Yes. sir.

25. Q. Are you acquainted with the signature of Mr. Lamar Lyndon?

A. Yes sir.

26. Q. And is the signature purporting to be that of Lamar Lyndon attached to each of these letters, his signature?

A. To the best of my knowledge, yes sir.

27. Q. And were these letters received in due course of mail after the dates which each of them bears respectively?

A. Yes, they were.

Witness has also produced what purports to be letter written by Mr. David S. Hays to Mr. Thomas Shipley.

28. Q. Are you acquainted with the signature of Mr. David S. Hays?

A. Yes sir.

29. Q. And this is his signature on this letter?

A. Yes sir.

30. Q. And this was received in due course of mail by you from Mr. Hays?

A. Yes sir.

31. Q. Where have these letters been since you received each of them?

A. In our files.

32. Q. The files of the York Manufacturing Company?

A. Yes.

33. Q. Please state now briefly what transpired with respect to this water-wheel governor project of Mr. Lyndon, commencing with your earliest connection with the matter, insofar as your knowledge goes as to those particulars.

A. After making the agreement with Mr. Lyndon with regard to the development of this invention, we secured sketches from him from which to make drawings. We had our engineering department develop these sketches, make drawings, with the intention of building

one of these machines, and further, had isometric sketches made so that the Patent Office drawings could be drawn, with the intention of having the same secured under letters patent. Before we had the machine built, our company decided that we would abandon the building or manufacturing of anything except ice-making or refrigerating machinery. We notified Mr. Lyndon of this fact and cancelled our agreement with him so far as the development of this apparatus was concerned. This way we settled this particular transaction.

34. Q. About when was this arrangement with Mr. Lyndon called off or terminated?

A. The first of the year of 1900.

35. Q. And what was the specific reason for so calling off this agreement?

A. Because we were so busy with the ice-making and refrigerating business that we decided not to attempt to do anything else.

36. Q. And has that been your sole line of business since that time?

A. That has been our only business since that time.

37. Q. Your business in that line is very extensive is it?

A. It is.

38. Q. What part of the business of the United States, approximately, do you do in this line?

MR. WESTALL: Objected to as immaterial.

A. About forty per cent. of the total business of the United States.

39. Q. Did you take up the matter of patenting or having patented rather, this invention of Mr. Lyndon with any patent attorney?

A. We did.

40. Q. Who was that patent attorney?

A. Marcellus Bailey.

41. Q. Is he still your patent attorney?

A. He is still our attorney.

42. Q. About when did you do that?

A. The latter part of the year of 1899.

43. Q. And what did Mr. Bailey do in that connection?

A. He took out a caveat on the invention.

44. Q. And do you know who, if anybody, paid the expense of filing that caveat?

A. The York Manufacturing Company paid it.

45. Q. Can you produce any evidence as to the payment of such account?

A. Yes sir, I have a bill of the item.

Witness produces receipted bill dated October 16, 1899, purported to be signed by Marcellus Bailey, the receipt being on what purports to be a billhead of said Marcellus Bailey.

46. Q. Is this the signature of Mr. Marcellus Bailey under the words, "Received Payment"?

A. Yes sir, that is his signature as I understand it.

47. Q. Can you produce any letters which passed from Mr. Marcellus Bailey to yourself or your Company in connection with the protection of this invention of Mr. Lyndon?

A. Yes sir.

Witness produces four letters purporting to be upon the letterhead of Marcellus Bailey and to be signed by Marcellus Bailey, being respectively of the dates August



29, 1899, September 4, 1899, September 8, 1899, and October 16, 1899.

48. Q. Were these letters received by your Company in due course of mail after the dates respectively appearing thereon?

A. They were.

49. Q. Do you know the signature appearing upon each of these letters and whose it is?

A. Marcellus Bailey's.

50. Q. The same patent attorney you referred to before?

A. Yes sir.

MR. BLAKESLEE: Complainant now offers in evidence the letters from Lamar Lyndon to Thomas Shipley and the York Manufacturing Company just discussed by the witness, eight in number, as "Complainant's Exhibit Lyndon-York Mfg. Co. Water Wheel Governor Letters", and asks the same be so marked as a single exhibit.

Complainant also offers in evidence the letter just discussed by the witness, from David S. Hays to Mr. Thomas Shipley as "Complainant's Exhibit Hays-Shipley Water-Wheel Governor Letter", and asks that the same be so marked.

Complainant further offers in evidence the four letters from Marcellus Bailey to the York Manufacturing Company, just identified by the witness, as "Complainant's Exhibit Bailey-York Mfg. Co. Water-Wheel Governor Letters", and asks that the same be so marked as a single exhibit.

Complainant also offers in evidence the receipted bill of Marcellus Bailey just identified by the witness as

“Complainant’s Exhibit Received Marcellus Bailey-Lyndon Water Wheel Governor Caveat Bill”, and asks that the same be so marked.

51. Q. Was there further correspondence between yourself and Mr. Lyndon and Mr. Hays and Mr. Bailey, or either or any of them, with relation to the various matters concerned in this correspondence, as reflected by these original letters which have just been offered in evidence?

A. I can’t say positively. I answered those letters that I have offered here.

52. Q. Did you keep any record of any of these letters or letter answers?

A. We kept a copy-book copy.

53. Q. Can you now produce the same?

A. Yes sir.

Witness produces a number of press copy-books containing letters.

54. Q. These are the record press copy-books of the York Manufacturing Company, are they, Mr. Shipley?

A. They are.

55. Q. Will you please turn to the several letter copies in these books and designate which of such letter copies you have included in your recent answers, and state by whom the letter was signed?

A. Lamar Lyndon, dated July 18, 1899, signed by myself. Lamar Lyndon, July 27, 1899, signed by myself. Lamar Lyndon, January 5, 1900, signed by myself. Lamar Lyndon, January 10, 1900, signed by myself. Lamar Lyndon, January 16, 1900, signed by myself. Lamar Lyndon, April 14, 1899, signed by myself. Lamar

Lyndon, June 19, 1899, signed by myself. York Manufacturing Co., Hays, March 22, 1899, signed by myself.

56. Q. These press copy books have been kept in the records of this Company since the times on which these letters were written, and copied therein?

A. They have.

MR. BLAKESLEE: We ask that these letters be copied verbatim from the press copy-books into the record at this point in connection with the testimony of this witness.

MR. WESTALL: Objected to as calling for not the best evidence, and the copying into the record is objected to as incompetent, irrelevant and immaterial.

July 18, 1899.

Lamar Lyndon,  
%American Trading Co.,  
100 William St., New York.

Dear Sir:

The writer begs to advise you that after talking over the matter with our people, we have concluded to go ahead with the water wheel governor about which we have had correspondence recently, and we will be pleased to have you write us a letter of instructions stating just how you wish us to proceed in order to secure a patent on this governor; in other words, please send us a letter specifying the claims you make for this governor so that we can have our patent attorney look it up. We hope to hear from you at your earliest convenience in regard to this matter.

Our Mr. McCormick has just returned from Holyoke, Mass., where he was superintending the test of one of our water wheels. We enclose you a blueprint of the test report on this wheel as made by the Holyoke Water Power Co., and will be pleased to have your opinion on a wheel giving an efficiency as noted on this report. Any suggestions

you may care to make will be greatly appreciated.

Yours truly,  
YORK MANUFACTURING CO.

Per Thos. Shipley,  
General Manager.

July 27, 1899.

Mr. Lamar Lyndon,  
%American Trading Co., New York.

Dear Sir:—

Yours of the 24th inst enclosing description of the Water Wheel Governor received. We will forward a copy of these specifications of yours to our Attorney in Washington and secure all possible protection on sale pending the getting up of drawings and more detailed specifications. The writer expects to be in New York next week and will make it a point to see you.

Yours truly,  
YORK MANUFACTURING CO.  
Per Thos. Shipley,  
General Manager.

Jan. 5, 1900.

Lamar Lyndon,  
New York.

Friend Lyndon:

Yours of the 2nd inst received and contents noted. The reason I have not answered ere this was because it was impossible for me to do so as our company was going to have a meeting yesterday in which we would decide upon several matters in relation to the course we are to pursue in the future; also to enlarge our capital stock to \$1,000,000. We have decided that we will not do anything whatever in any business outside of our regular line. I tried to have our people agree to continue and finish the work on your water wheel governor. This however they decided not to do, owing to the fact that we have been compelled to increase our drafting room force. We have made Mr. L. S. Morse the draftsman who had charge of your work, our chief drafts-



man, making Mr. Brostrom, our former chief draftsman, our mechanical engineer, and given Mr. Morse charge of the drafting room.

We have so much work that it was necessary for us to put on a few more men in the drafting room, and the question of what the men were doing came up, and as your work was taking up one of our best men, our people decided that we had better not go any further with it, but turn the matter over to you as it now stands, charging you nothing at all for the work we have done, or anything for the advances we made in regard to the caveat on the patents, but turn the whole matter over to you as it stands.

The writer feels rather disappointed in not being able to go ahead and finish this as he believes there ought to be some future to the apparatus. He thinks, however, that the work we have done will be a big benefit to you in pushing the matter further, and as it has cost you nothing, you will suffer no monetary loss.

Hoping that you will look at this matter the same as I do, and awaiting the favor of your reply, I am,

Yours truly,

Thomas Shipley.

Jan. 10, 1900.

Lamar Lyndon,

100 William St., New York.

Dear Sir:

Yours of the 8th inst. received and contents noted. We are very sorry indeed that the matter has gotten into its present shape, but it is really impossible for us to take the matter up further, owing to the fact that our Board of Directors have decided to drop it, and it is not in my power to open it up again. We would like very much to develop and manufacture this governor for you, but we do not see how we could possibly do it. We did not take this matter up with the intention of dropping it, as we fully expected at the start to push the thing through to completion, but as stated to you in our

previous letter, we have secured so much business in our regular lines, that we could not go ahead with your governor without seriously inconveniencing our business.

Trusting this explanation will be satisfactory, we are,

Yours truly,

Thos. Shipley, Gen. Mgr.

YORK MANUFACTURING COMPANY.

Jan. 16, 1900.

Lamar Lyndon,

%American Trading Co.,

100 William St., New York.

Dear Sir:

Yours of the 13th inst received and contents noted. In reply beg to say that we regret as much as you do that we are unable to continue the development of your water wheel governor, but circumstances are such that it is really impossible for us to give this matter further attention, much as we would like to do it. The writer is just leaving on a little business trip and has instructed our Mr. Morse to collect all blueprints, sketches and papers relating to your governor and we will forward them to you at the earliest possible moment.

Trusting this will be satisfactory, I am,

Yours truly,

Thos. Shipley, Gen. Mgr.

YORK MANUFACTURING COMPANY.

April 14, 1899.

Lamar Lyndon,

%American Trading Co., New York.

My dear Mr. Lyndon:

Yours of the 27th ult to the writer was received during his absence from this city which will account for the delay in answering same. In reference to the arrangement to patent, develop and place your governor on the market, the writer begs to say that he understood from Mr. Hays that we were to have 60% interest in the ownership and accruing prof-

its. However, the writer begs to say that he expects to be in New York in the near future, and will see you and talk over this matter, and we have no doubt that a satisfactory arrangement can be made between us that will be satisfactory to all concerned.

Regretting the delay in answering your letter, and hoping to see you before long in New York, I am,

Yours truly,

Thos. Shipley.

June 19, 1899.

Lamar Lyndon,

%American Trading Co., New York.

Dear Sir:

Yours of the 7th inst was received while I was away from this city, hence the delay in answering same. I expect to be in New York next week, and will take the opportunity of looking you up and taking up the matter of governors with you.

Hoping to see you soon, I am,

Yours truly,

Thos. Shipley.

March 22, 1899.

York Mfg. Co., Hays,

New York.

Dear Sir:

Yours of the 20th to the writer received and note what you say about Mr. Lyndon of the American Trading Co. and the water wheel governor of which he is making plans. In reply beg to say that we would be willing to enter into such an arrangement and would suggest that you have him send us sketches and necessary information for getting out the drawings he requires.

Yours truly,

YORK MANUFACTURING CO.

Per Thos. Shipley,

General Manager.

to the addressees in due course of mail, to your knowledge?

A. They were, to the best of my knowledge.

58. Q. What was Mr. Lyndon's attitude during the time covered by your activities, as testified, in connection with this water-wheel governor with respect to demand for such governor and the general possibilities of manufacture in exploitation of the same?

A. Mr. Lyndon was very anxious to have this apparatus developed as he was of the opinion that a ready market could be had for same.

59. Q. At this time, namely, during when you were working on this governor matter of Mr. Lyndon's, did you have any other hydraulic propositions before your company, and if so, what?

A. We did; at that time we were manufacturing the McCormick water-wheel.

60. Q. How long did you continue to manufacture that water-wheel?

A. We manufactured it for about two years, between two and three years.

61. Q. And when did you discontinue the work?

A. At the time we decided to give up all other business except the ice-machine business.

62. Q. And was there, or was there not any connection in the plans of your Company between the exploitation of the Lyndon water-wheel governor and the exploitation of the McCormick water-wheels, and if so what?

A. We believed that they could be worked in conjunction one with the other.



63. Q. I now show you four blueprints, to which are attached what purports to be copies of certain correspondence and also what purports to be affidavit of one Thomas Shipley, and will ask you if you have seen these papers before, and if so what, if anything, you know about them?

A. The papers are copies of letters which were received by our Company in the regular course of our business in connection with this invention of Mr. Lamar Lyndon.

64. Q. When did you ever see any of these papers before, under any circumstances; that is, these very papers themselves, including the blueprints?

A. These papers were gotten up in pursuance to a request made us by a representative of Mr. Lyndon at the date set forth in the papers, the 13th of August, 1913.

65. Q. And do you know whose affidavit that is attached?

A. My affidavit.

66. Q. When did you first see the blueprints among these papers?

A. These blueprints are our original copies that we kept at the time we turned the originals back to Lyndon, at the time when our agreement was cancelled.

67. Q. Copies of what, please?

A. Of drawings made in these works in pursuance of the agreement we had with Mr. Lyndon.

68. Q. And where were the blueprints made, if you know?

A. Made here in our drafting-room.

69. Q. And can you state during what year?

A. During the year 1899.

70. Q. Do you personally know what was done with the original drawings, or any blueprints or copies thereof, other than these blueprints?

A. The original drawings from which these prints were taken were turned over to Mr. Lyndon at the time when our agreement was cancelled. At the time when these blueprints were sent to Mr. Lyndon, we took photographic reproductions of them.

71. Q. Do you know whether any further duplicates of these blueprints were sent to any other person than Mr. Lyndon at any time?

A. I don't remember ever having known any of them to be sent to anybody else.

72. Q. Do you know what if any matter was sent to Mr. Marcellus Bailey in connection with his work of attending to the protection of Mr. Lyndon's invention?

A. The original use to which two of these drawings were put was to furnish a sketch to Marcellus Bailey to make up patent drawings. My statement as before given was with reference to drawings since the time when we cancelled this agreement.

73. Q. Do you know which of these blue-prints correspond to the other blueprints or drawings which were sent to Mr. Bailey in this connection?

A. Mr. Bailey likely has a copy of all these, but these isometric drawings were particularly gotten up for this use.

74. Q. Those were which ones, counting from the top of the blueprints?

A. The first two.

MR. BLAKESLEE: Let the record show that the witness has just been referring to "Complainant's Exhibit Lyndon-York Mfg. Co. Correspondence and Blueprints and Identifying Affidavits."

75. Q. Can you produce any further letters from Mr. David S. Hays to your Company or yourself pertinent to this Lyndon water-wheel governor matter?

A. Yes sir.

Witness produces three letters purporting to be addressed respectively to Mr. Thomas Shipley and the York Manufacturing Company, and of the dates of June 19, 1899, March 23, 1899 and May 1, 1899 respectively, and purporting to be signed by David S. Hays.

76. Q. Do you know whether these letters were received by your Company in due course of mail after the dates appearing thereon?

A. They were.

77. Q. And whose signature appears appended to each of these letters?

A. David S. Hays.

78. Q. The same David S. Hays you previously referred to?

A. Yes sir.

Complainant offers in evidence these further three letters just identified by the witness as "Complainant's Exhibit Hays-Shipley & York Mfg. Co. Water-wheel Governor Letters" and asks that the same be so marked as a single exhibit.

79. Q. Where have these three letters been since the dates of their receipt, if you know?

A. They have been in our regular file.

80. Q. Subsequent to the return of the original drawings and other papers to Mr. Lyndon at the time you broke off relations as to this Lyndon water-wheel governor, have you, to your knowledge, sent any further letters or drawings to Mr. Lyndon, or delivered same to him, other than those of "Complainant's Exhibit Lyndon-York Mfg. Co. Correspondence and Blueprints and Identifying Affidavits", which is before you?

A. I have no remembrance of any other being sent.

81. Q. In connection with this Lyndon Water-wheel governor matter, was there any time any actual shop-work done upon such a governor in the plant of the York Manufacturing Company, or under its control or direction?

A. Not that I remember.

#### CROSS-EXAMINATION.

By Mr. Westall:

82. Q. Mr. Shipley, at the time this matter was first taken up with Mr. Lyndon, what was your connection with the Company?

A. I was General Manager and Vice-President.

83. Q. And did you have personal charge of the matter of entering into the agreement about which you have spoken?

A. Yes, it was my duty; entirely so.

84. Q. Did you personally look into the matter of the feasibility of the project?

A. Yes sir, I did.

85. Q. Have you produced all the letters that pass-



ed between your Company or yourself or anyone for your Company, and Mr. Lyndon?

MR. BLAKESLEE: It is to be noted that the testimony of this witness has referred only to matters of which he has personal knowledge or was personally concerned in, as to the transmission or receipt of the same. Therefore, the question is objected to as not cross-examination.

A. Everything that we can find, yes sir.

86. Q. And how far had the work of preparing drawings and trying to develop the water-wheel governor progressed at the time you and your company abandoned the agreement?

A. It was ready for the shop; that is, ready to begin making patterns and going ahead with the manufacture of a trial machine.

87. Q. Did Mr. Lyndon ever attempt to hold you in any action at law for damages for failure to go on with the work?

A. He did not. He never attempted, so far as I remember of holding us up in any way.

88. Q. The letters which you have referred to as being contained in the letter press books, have you omitted to mention any letters in such books that were written by you or sent by you, to Mr. Lyndon or to any one else?

A. I didn't look through those books. I only acknowledge having sent those that I signed my signature to. There may be other ones in there. I don't know, though, that they are.

89. Q. Did I understand you to say that the York

Manufacturing Company paid the expense of the application for a caveat?

A. For a caveat.

90. Q. But did not bear any of the expenses of the application for a patent that was thereafter filed?

A. No sir, not that I know of, we didn't.

91. Q. The York Manufacturing Company, on account of its services and the advancement of money for the caveat, did not thereafter claim any interest in the patent, did they?

A. No sir.

92. Q. And was the York Manufacturing Company ever reimbursed for the expense to which they had been put?

A. No sir. We considered that we got off very luckily in that matter, because Mr. Lyndon might have held us up for not carrying out our agreement, so we assumed our own expenses. We assumed the expenses that we had gone to.

93. Q. No experiment of any kind was made of any part of the device, that is, of the water-wheel governing apparatus, was there?

A. Not that I know of, no sir, not while it was with us. Not while we had anything to do with it.

#### RE-DIRECT EXAMINATION.

By Mr. Blakeslee:

94. Q. Can you state a little more specifically what transpired between you and Mr. Lyndon when you first personally took up this Lyndon water-wheel governor matter with him in the early part of 1899?

MR. WESTALL: Objected to as not proper re-direct examination.

MR. BLAKESLEE: The record speaks for itself.

A. Mr. Lyndon saw our Mr. Hays, to whom he stated that he had a new water-wheel governor and he persuaded Mr. Hays to write me in an effort to get the York Manufacturing Company interested in this new invention. In pursuance to this inquiry, I met Mr. Lyndon in New York, talked over the matter with him. The apparatus at that time was in a very early stage, it was necessary to develop it theoretically before it could be put in practical form. It was to do this and to put it in such shape so that it could be put on the market that Mr. Lyndon wanted the York Manufacturing Company to accomplish.

95. Q. Did you go into the details of construction of this governor with Mr. Lyndon when you saw him personally at that time?

A. I did.

96. Q. And did anybody else do so then or later on behalf of your Company?

A. When I decided that we would take this up, I turned it over to the engineering department, with instructions that they should communicate with Mr. Lyndon and proceed with the development of the invention.

97. Q. Did anybody else see Mr. Lyndon on behalf of your company in this connection?

A. Mr. Morse, who was then our chief draftsman, saw Mr. Lyndon and corresponded with him afterward in regard to this matter.

98. Q. Is he in your employ at the present time?

A. He is.

99. Q. In what capacity?

A. He is our executive engineer.

100. Q. Please state whether or not, at the time you first took this water-wheel governor matter up personally with Mr. Lyndon, you did receive from him an understanding of the nature of the invention and its character and intended mode of operation and practice.

A. Mr. Lyndon explained to me the theory of his apparatus.

101. Q. What steps did you take to have picked out or singled out the letter copies in the press books of the York Manufacturing Company, which you have identified in your deposition?

A. I gave instructions to our legal department and to my secretary to search the files and get all the correspondence that they could find together, so that this matter could be put before the gentlemen representing the parties in controversy.

102. Q. And were these various letter copies brought before you as being a complete record of such correspondence or not?

A. They were brought before me as being as complete as could be found during the time that has been spent in the search, the time being very short.

103. Q. Are there any press copy letter books missing from the books covering the period of time involved in this correspondence between yourself, Mr. Lyndon, Mr. Hays and Mr. Bailey?

A. There is one book missing.



RE-CROSS EXAMINATION.

By Mr. Westall:

104. Q. From the time the matter was first mentioned to you by Mr. Lyndon, how long was it before you took it up seriously with your engineering department, or entered into any agreement with Mr. Lyndon?

A. Possibly two months; two or three months.

105. Q. And after that agreement, how long were you working upon the development of the device before abandoning it?

A. About six months.

106. Q. Who was working on the device, during that six months, of your engineering department?

A. Mr. Morse. He had charge of it. He did the principal work.

107. Q. And he prepared the tracings from which the blueprints were made?

A. Yes; that is, two of them. The other one was made by a Mr. Spangler. That is, the insometric blueprint was made by Mr. Spangler.

108. Q. And why, if you know, did it take him that length of time to prepare the drawings and get the matter in shape?

A. Because we had other work to do in the same time, and because it required some considerable study and correspondence back and forth.

109. Q. That is to say, the details of organization and arrangement had to be worked up, didn't they?

MR. BLAKESLEE: Objected to as calling for conclusions; not proper cross-examination.

A. Yes, it had to be developed.

110. Q. And until they were worked out completely, you felt that you were not in any position to apply for any patent, is that true?

MR. BLAKESLEE: Objected to as calling for conclusions, not the proper method of proof, not calling for a statement of facts.

A. We couldn't attempt to get a patent until we had the apparatus laid out so that it would be descriptive of the invention.

111. Q. And until you were sure that you knew how the different elements were to be assembled. Is that correct?

MR. BLAKESLEE: Same objection.

A. Yes sir.

112. Q. And at the time you abandoned the project, you hadn't had the matter in such shape that you could apply for the patent, had you?

MR. BLAKESLEE: Objected to as not calling for a statement of facts, rather for conclusions in respect to the use of the term "abandoned"; furthermore, as not cross-examination with respect to the present witness applying for any patent.

A. Yes, I believe we had it in such shape at that time. We had the drawings ready for the shop, which meant that we were ready to make the apparatus.

113. Q. Were many of the details of rearrangement suggested by the draftsman who was getting up these drawings?

MR. BLAKESLEE: Objected to as calling for a conclusion and not a proper method of proof, not a statement of fact, manifestly not the best evidence inasmuch

as what someone else might have suggested should be adduced from him and not from the present witness.

A. The draftsman developing the work necessarily suggested the mechanical proportions of the design, or parts of them, at least.

RE-DIRECT EXAMINATION.

By Mr. Blakeslee:

114. Q. In whose name was it that any protection by patent or caveat was to be secured or attempted to be secured, with respect to this water-wheel governor we are discussing, as per your instructions to your patent attorney, Mr. Bailey?

MR. WESTALL: Objected to as assuming that the witness instructed the patent attorney, Mr. Bailey, which has not been shown.

A. The protection was gotten in the name of Lamar Lyndon.

LOUIS S. MORSE, witness produced on behalf of the complainant, being duly sworn, testifies as follows in answer to interrogations <sup>poses</sup> ~~propounds~~ propounded by Mr. Blakeslee.

115. Q. Please state your full name, age, residence and occupation.

A. Louis S. Morse, 493 Madison Avenue, York, Pa., executive engineer and chief draftsman of the York Manufacturing Company; aged forty-two.

116. Q. How long have you been connected with the York Manufacturing Company?

A. Twenty years.

117. Q. Are you acquainted with one Lamar Lyndon, a consulting engineer of New York City?

A. I am.

118. Q. When did you first meet Mr. Lyndon?

A. In the latter part of 1898.

119. Q. Under what circumstances, and where?

A. In New York City, to make sketches of the governor for the water-wheel.

120. Can you specify the time that you took up this matter with Mr. Lyndon any more particularly?

A. Well, I think it was in either November or December.

121. Q. What did you do at that time in that connection?

A. I met Mr. Lyndon first at David Hays' office and the following day in his office at the American Trading Company.

122. Q. Who was the David Hays you refer to?

A. David Hays at that time was the New York representative of the York Manufacturing Company.

123. Q. How do you fix the time as November or December, 1898?

A. From two drawings that I later made, and the title of the drawing not only gave us the title but the date was also subscribed to it.

124. Q. Do you know where these drawings are now?

A. Those drawings were turned over by me to, I think, to Mr. Stebbins of this company. I don't know their exact disposition.

125. Q. Do you know whether any blueprints were made of them?

A. Yes, blueprints were made of them.



126. Q. I show you a group of papers including four blueprints, concealing identification of the papers, and ask you whether you know anything about those blueprints, and if so, what?

A. The blueprints from drawings 5852 and 5922 I recognize as being made from the drawings that I personally made.

127. Q. Do you know when these blueprints were made?

A. There is no identifying mark that our Company has, by which I can tell when they were made.

128. Q. I note that one of these blueprints, namely the lowermost one in the series of four blueprints, has the date on it of December 6, 1899 and the one above it has the date of November 10, 1899. Do you know what those dates signify?

A. That signifies the date of the completion of this particular drawing from which the blueprint was made.

129. Q. Is there any relation between these original drawings from which these blueprints were made, and the drawings that you previously referred to as having been made after you saw Mr. Lyndon in New York?

A. They are one and the same drawing, but I have to correct here my statement that I met him in 1898. It was the same year in which these drawings were made.

130. Q. And what part of that year?

A. Well, it was prior, within a week or two of this date.

131. Q. (By Mr. Westall) November 10, 1899?

A. Yes sir.

132. Q. Please state what transpired when you saw

Mr. Lyndon at the time you discussed this water-wheel governor with him, preparatory to making these drawings that you have referred to.

A. He described to me, in a general way, when I first met him of the need of another improved water-wheel governor. The second time that I met him he showed me some rough sketches and explained to me ideas that should be developed in this new type of governor.

133. Q. Do you remember, now, what those sketches showed in general, and what he disclosed to you in connection with them?

A. These sketches showed not very much detail and simply the general working and the working idea of the machine. And those two drawings which I identified as made up there, conformed with his sketches.

134. Q. That is, the two drawings of which these two lower blueprints we have just referred to are taken from?

A. Yes sir.

MR. BLAKESLEE: Let it be shown that the witness in referring to four blueprints has been referring to the blueprints of "Complainant's Exhibit Lyndon-York Mfg. Co. Correspondence and Blueprints and Identifying Affidavits.

135. Q. Are you able now to recollect generally what Mr. Lyndon disclosed to you at that time in connection with this proposed shop development of his invention?

MR. WESTALL: Object to the use of the words "shop development" as a stage of progress in the development which has not been shown.

A. As I recall, he didn't pretend to me at that time to go into the detailed construction on these general drawings which I had prepared.

136. Q. Can you state further, from your present recollection, what he did lay before you that time in this connection?

A. I don't think I can answer that question more fully than what I have already said, that he wished a drawing showing the outline of his ideas, a general outline.

137. Q. Do you remember what his ideas were, as stated to you at that time?

A. Yes, as shown up on these drawings.

138. Q. On the drawings of which these blueprints you refer to are copies?

A. Yes sir.

139. Q. During the year 1899, what was the condition of the drafting department of the York Manufacturing Company as to pressure of work?

A. As I recall it, that was one of our very busy seasons in which we were cramped in the drafting department, by which I mean that we were all working on new designs for the York Manufacturing Company, and my time and nearly every one else's time was taken up on our own work.

140. Q. Was that work in connection with hydraulic apparatus of any kind?

A. No sir, ice-making and refrigerating machinery.

141. Q. Do you recollect any other sketches that were provided by Mr. Lyndon for you during that year, in connection with this water wheel governor?

A. I have a faint recollection, if I may put it that

way, of some sketches that came in from him by mail afterwards.

142. Q. Referring to the uppermost two blueprints of this exhibit, we have been discussing, do you know anything about those, and if so, what?

A. Those are blueprints from drawings that were made by a member of our drafting department.

143. Q. Were they made under your supervision or with your knowledge?

A. They were made with my knowledge.

144. Q. And do you know what was done with the original drawings?

A. I think that those original drawings, I might say I am positive that those original drawings were included with the drawings from which the two lower prints were made that were handed to Mr. Stebbins by me some years ago.

145. Q. Do you know what, if anything, was done with any blueprints of such drawings prior to that time?

A. I do not.

146. Q. Were or were not you able to gather, from what Mr. Lyndon told you in 1899, on the occasion of your visit to him in New York in connection with the water wheel governor, what the purposes and functions and general mode of operation were of this waterwheel governor which he put before you?

A. As I recollect it, he believed that he could improve the smoothness of the action of the governor.

147. Q. And did he or did he not make it plain to you what the mode of operation of such governor was to be?



A. I think at that time he made it plain to me.

CROSS-EXAMINATION.

By Mr. Westall:

148. Q. You say that you met Mr. Lyndon first and received your first knowledge of this device a week or two prior to November 10, 1899? You did not at that time receive sufficient knowledge from Mr. Lyndon to go ahead and complete the invention, did you?

MR. BLAKESLEE: Objected to as calling for a conclusion; not a proper method of proof in cross-examination and not calling for a statement of facts.

149. Q. That is to say, you felt that you would have to have further conferences with Mr. Lyndon as the work progressed, in order to fully understand his ideas, didn't you.

MR. BLAKESLEE: Same objection, calling for mere opinion or guess, and not for a statement of facts.

A. When I met Mr. Lyndon, he described to me in brief the working principles of this governor and gave me sufficient sketches so that I could make a general assembled drawing of the governor. Does that answer your question?

150. Q. I think so. Now, you have spoken about a second time that he showed sketches and explained his ideas regarding a new type of governor.

A. I may have confused you with that. I met him twice. I met him one day in Mr. Hays' office and the following day, or the next day, I am not sure, but on my same visit to New York which did last longer than three or four days, I met him again.

151. Q. Was it after you have completed the original drawings from which the blueprints to which you have referred ("Complainant's Exhibit Lyndon-York Mfg. Co. Correspondence and Blueprints and Identifying Affidavit") were made, that you say you have an impression that you received other drawings or sketches from Mr. Lyndon?

A. Very shortly after those drawings were made.

152. Q. And do you remember what the subject matter of those additional sketches were, or why Mr. Lyndon sent them to you?

A. I'm sorry I can't answer that question. I do not.

153. Q. Did you ever incorporate any of the ideas of those additional sketches in the blueprints or in the drawings after that?

A. I personally never did.

154. Q. Did someone else, to your knowledge?

A. I believe they did. I believe that some of those sketches were worked up into drawings in our drafting department.

155. Q. You say that the sketches did not show very much detail, but simply the general working idea of the machine. Do you mean by that, that the details of the organization of the various elements was left to your skill and knowledge as a draftsman or designer?

A. They would have been left to our skill had it been left to us to completely design the machine.

156. Q. Supplemented, of course, by what other sketches he may have held back?

A. You understand that this drawing that he wanted me to get up was not a detailed drawing. It was known

in engineering as an assembly drawing, many people call it an outline drawing, and didn't go into detail at all.

157. Q. The assembly drawing to which you have just referred, was one of the drawings dated November 10, 1899, was it not?

A. Yes sir.

158. Q. Now, at the time of the making of the assembly drawing referred to in your last answer, you didn't have sufficient data or the detail had not been worked out sufficiently to construct a governor, had they?

MR. BLAKESLEE: Objected to as calling for conclusion, not a statement of facts.

A. I had information at that time that I could have worked out a governor, but the whole thing was to be submitted to Mr. Lyndon, of course, before the drawings were finally approved.

159. Q. In order to find out whether you had incorporated wholly the ideas and understood the purpose and object in working the device?

MR. BLAKESLEE: Same objection.

A. Yes sir.

160. Q. Now, how long after that, to your knowledge, was the York Manufacturing Company working on this device or on the drawings connected with it?

A. I am unable to say.

161. Q. At that time had you had any particular skill as a hydraulic engineer?

A. I could not have qualified as an expert hydraulic engineer.

162. Q. Did you ever make any special study of the

feasibility of the device, at or about the time you made these drawings?

A. No sir.

163. Q. You merely assumed that the device could be worked out so as to be operative, did you?

MR. BLAKESLEE: Objected to as calling for statement of guess, not for statement of facts, for mere opinions and conclusions.

A. I did.

164. Q. What was done with the original drawings from which the blueprints to which you have referred were taken, immediately after they were made?

A. They were filed in our vaults.

165. Q. And were they ever taken out shortly after that for reference, or were they kept there continuously after being put in?

A. I believe that they were kept there in our vaults until they were finally removed.

166. Q. So that, according to your recollection, it was shortly after these drawings were made that the matter was abandoned by the York Manufacturing Company. Is that correct?

MR. BLAKESLEE: Objected to as calling for conclusions with respect to alleged "abandonment", and not a statement of facts.

A. It was shortly after that time that the drafting department had anything to do with it.

167. Q. You mean that shortly after —

A. Perhaps I can make that plainer by saying that the matter dropped out of mind, you might say, so far as the drafting department was concerned, a very short



time after those drawings were made. I don't know what interest the York Manufacturing Company had.

168. Q. And were those the only drawings that were made by the drafting department?

A. Are you referring to those two drawings?

169. Q. I mean all the blueprints contained under that cover marked "Complainant's Exhibit Lyndon-York Mfg. Co. Correspondence and Blueprints and Identifying Affidavit."

A. The only drawings made to my knowledge.

170. Q. If other drawings were made, would you know of it?

A. I would know of it if they were made under my immediate charge. I might amend that by saying that I am away from the factory at times, and any drawings made during a lengthy vacation that I may have taken I would not retain those in my mind so well as those that were made while I had direct supervision of the drafting room.

171. Q. At this present time, after the lapse of so many years, have you any very positive and distinct recollection as to the numbers of drawings and sketches that may have been submitted by Mr. Lyndon or that may have been made by the drafting department from those sketches?

A. I don't know how many sketches were submitted, but I feel sure those four drawings, as I said before, were the only drawings made, reasonably sure, drawings made under my supervision or to my knowledge.

172. Q. And to your knowledge, no drawings were made by your drafting department prior to November 10, 1899, were they?

A. No.

173. Q. Now, you have stated that Mr. Lamar explained to you that he wanted to improve the governor in order to have a smoothness of action, I believe you said. What governor did you understand that he was improving?

A. I understood he was getting up an entirely new governor to improve and perfect a new governor.

174. Q. Did you ever have any conversation concerning these drawings or these blueprints to which you have referred, or concerning the device illustrated in such blueprints, at or about the time the York Manufacturing Company gave up or abandoned the undertaking?

MR. BLAKESLEE: Objected to as incomplete, it not being shown by the question with whom the discussion is supposed to have taken place; furthermore, that there is necessarily not shown that a conversation was had with either of the parties to this issue, or their assigns.

A. No.

175. Q. Did you ever talk over the question of the feasibility of the device with any of the officers or agents or employees of the York Manufacturing Company at or about the time you made these drawings?

A. No, sir.

176. Q. Or after that time?

A. No sir.

#### RE-DIRECT EXAMINATION.

By Mr. Blakeslee:

177. Q. Referring to the upper blueprints of the

group of four blueprints we have been discussing, and the exhibit, of course, do you know by whom those were made, or the original drawings thereof?

A. I believe the original drawings were made by a Mr. Spangler, a draftsman in our employ.

178. Q. Do you know when they were made?

A. I can't state definitely. I think they were made very shortly after those drawings from which the two lower prints were made.

179. Q. Are you sure as to that?

A. I am sure that they were made within three months from that time.

180. Q. And are you sure whether they were made before or after?

A. They were made after.

181. Q. But you had nothing to do with the making of them?

A. I didn't make them.

THOMAS SHIPLEY, witness previously called on behalf of the complainant, being recalled, testifies as follows in answer to interrogatories propounded by Mr. Blakeslee:

199. Q. I call your attention further, Mr. Shipley, to what purports to be the copy of a letter dated June 11, 1900, to Lamar Lyndon and signed by Thomas Shipley in letter press copy book of the York Manufacturing Company, and ask you if you know who signed the original letter and what was done with the letter.

A. The letter to Lamar Lyndon, dated June 11, 1900, signed by myself, was sent to Mr. Lyndon as addressed through the regular mail.

200. Q. Have you ever had any dealings with any other person by the name of Lamar Lyndon than the one concerning whom you have testified this afternoon, a consulting engineer of New York City?

A. We have not.

STATE OF PENNSYLVANIA, County of York, ss:

GRACE M. DRAYER, being duly sworn, deposes and says, that she is a citizen of the United States and a resident of York, County of York, State of Pennsylvania, and upwards of the age of twenty-one years and a notary public of the State of Pennsylvania, and a stenographic reporter; that the foregoing depositions of Thomas Shipley, Theodore A. Stebbins, Louis S. Morse, Robert A. Spangler, and Earle W. Gardner were taken, written down by me stenographically and thereafter by me reduced to writing, together with the proceedings had in connection with the taking of such depositions, including the offer of the several exhibits mentioned in the foregoing record of such proceedings; that the Complainant in said suit, George J. Henry, Jr., was represented at such proceedings by Raymond Ives Blakeslee, Esq., Solicitor and counsel for Complainant, and the defendant, City of Los Angeles, was represented in the taking of said depositions and in the proceedings by Joseph F. Westall, Esq., Solicitor and of counsel for defendant; that the foregoing is a true and correct record of all of the testimony given by such witnesses and the proceedings had in connection therewith; that each of said witnesses was duly sworn by me in accordance with the law made and provided, before giving his testimony;



that I am not connected with either of the parties to said litigation in the relation of attorney or counsel or by matter of interest whatsoever, nor am related to either of such parties by blood or marriage.

(Signed)

GRACE M. DRAYER.

Sworn and subscribed to before me this 28th day of May,  
A. D. 1915.

NELLIE R. CROSS,

Notary Public.

My commission expires March 27, 1917.

2558

*Endorsed* George J. Henry, Jr., vs.

IN THE UNITED STATES DISTRICT COURT,  
SOUTHERN DISTRICT CALIFORNIA,  
SOUTHERN DIVISION.

GEORGE J. HENRY, JR.,  
Complainant,

vs.

CITY OF LOS ANGELES,  
Defendant.

In Equity No. A-87.

Proceedings taken on behalf of the Complainant in rebuttal, pursuant to stipulations between the parties and orders of Court, before Grace M. Drayer, Notary Public and Reporter, at the City of York, County of York, Pennsylvania, May 21st, 1915, at the office of the York Manufacturing Company, at two o'clock P. M.

GRACE M. DRAYER.

Notary Public and Reporter.

*Filed Sept 16<sup>th</sup> - 1915*

*Wm Van Wyke Clerk*

*Wm Van Wyke*

*Deputy Clerk*

IN THE UNITED STATES DISTRICT COURT,  
SOUTHERN DISTRICT CALIFORNIA,  
SOUTHERN DIVISION.

GEORGE J. HENRY, JR.,  
Complainant,

vs.

CITY OF LOS ANGELES,  
Defendant.

In Equity No. A-87.

Depositions on behalf of Complainant in rebuttal.

Met pursuant to adjournment before Grace M. Drayer, Notary Public and Reporter, at the legal department of the York Manufacturing Company, York, Pennsylvania, at 9 o'clock, Saturday, May 29th, 1915.

PRESENT: Raymond Ives Blakeslee, solicitor and counsel for Complainant, and Joseph F. Westall, solicitor and of counsel for defendant.

LOUIS S. MORSE, a witness previously called on behalf of the Complainant in rebuttal, and having been duly sworn, testified further for Complainant, on recall, as follows, in answer to questions put by Mr. Blakeslee:

1. Q. I show you a number of sketches and papers connected together, concealing the identifying affidavit and the identifying writing on the back, and ask you if you have ever seen these papers before?

A. Yes, these papers I recognize as having been in our possession prior to the making up of the isometric sketches.

2. Q. Being the first and second blueprints in order

of the "Complainant's Exhibit Lyndon-York Mfg. Co. Correspondence and Blueprints and Identifying Affidavits"?

A. Yes.

3. Q. How early did you see these papers just submitted to you, giving the time as definitely as you can?

A. I can't give you the definite time, but these papers were in our possession prior to the making of these (referring to the blueprints of the exhibit last identified) as I believe, sometime during the summer of 1899.

4. Q. Do you know where these papers just submitted to you came from?

A. These papers?

5. Q. Yes.

A. They look to me like—Yes, they are Lyndon's sketches. This is Lyndon's sketch.

Witness points to the sketches on yellow paper marked III, and also further indicates all of the yellow paper sketches of these papers marked I, II, and III, and also the sketches on paper marked IV and V.

6. Q. In your previous testimony, you stated that you made a trip to New York to see Mr. Lyndon in connection with the water wheel governor matter some short time prior to November 10, 1899. Have you any further and more definite recollection now as to the time of such first visit for that purpose, and if so, what?

A. I can only say it was between the summertime and November.

7. Q. You also testified previously that, to the best of your recollection, the top two blueprints of "Complainant's Exhibit Lyndon-York Mfg. Co. Correspondence and



Blueprints and Identifying Affidavit" were made subsequent to the making of the lowermost two blueprints of this Exhibit. Have you any further recollection in that respect, and if so, what?

A. Yes, I know I was in error in stating that these isometric sketches were made after the December drawings. I know that they were made now before the assembly of the water wheel governor, the drawings made by me.

8. Q. In other words, the two upper blueprints were made before the two lower blueprints of this exhibit?

A. Of that exhibit, yes sir.

9. Q. And do you know what was done with those two upper blueprints, or the originals thereof, the isometric drawings?

A. Those originals passed out of my hands and, as I remember it, were delivered to Mr. Stebbins, Mr. Shipley's secretary.

MR. BLAKESLEE: The witness has been referring to "Complainant's Exhibit Lyndon Early Construction Sketches and Identifying Affidavit" in discussing the sketches No. I to V inclusive.

CROSS-EXAMINATION by Mr. Westall:

10. Q. Please state what leads you to believe that the isometric drawings were made before the assembly drawings?

A. I recall now that Mr. Lyndon, when he instructed me about the assembly drawings, was talking about the perfection of the machine make it compact, and mechanical features; that no particular mention was given as to the general principles at that time, it having been

thoroughly discussed, or at least taken for granted that these principles were known by us, and we were simply perfecting the general arrangement of the governor.

11. Q. Your recollection is distinct and positive on that point at the present time?

A. Yes.

12. Q. And how do you know that these sketches on yellow and white paper marked in Roman numerals, I, II, III, IV and V, were Mr. Lyndon's sketches?

A. Why, the only way I can testify to that is that, in my position, we observe quickly the peculiarities of the different men's sketches. These sketches all seem to have the same general peculiarity and I recognize one in particular as having been Mr. Lyndon's sketch. The same general peculiarities seem to prevade all the sketches.

STATE OF PENNSYLVANIA, County of York,—ss:

GRACE M. DRAYER, being duly sworn, deposes and says, that she is a citizen of the United States and a resident of York, County of York, State of Pennsylvania, and upwards of the age of twenty-one years and a notary public of the State of Pennsylvania, and a stenographic reporter; that the foregoing depositions of Louise S. Morse and Robert A. Spangler, were taken, written down by me stenographically and thereafter by me reducing to writing, together with the proceedings had in connection with the taking of such depositions, including the offer of the several exhibits mentioned in the foregoing record of such proceedings; that the Complainant in said suit, George J. Henry, Jr., was represented at such proceed-

ings by Raymond Ives Blakeslee, Esq., Solicitor and counsel for Complainant, and the defendant, City of Los Angeles, was represented in the taking of said depositions and in the proceedings by Joseph F. Westall, Esq., Solicitor and of counsel for defendant; that the foregoing is a true and correct record of all of the testimony given by such witnesses and the proceedings had in connection therewith; that each of said witnesses was duly sworn by me in accordance with the law made and provided before giving his testimony; that I am not connected with either of the parties to said litigation in the relation of attorney or counsel or by matter of interest whatsoever, nor am I related to either of such parties by blood or marriage.

Sworn to and subscribed before me this 2d day of June,  
A. D. 1915.

(Signed) GRACE M. DRAYER.

NELLIE R. CROSS,

Notary Public.

My Commission expires

March 27, 1917.

2564

*Endorsed*

*George J. Henry, Jr., vs.*

IN THE UNITED STATES DISTRICT COURT,  
Southern District of California,  
Southern Division.

GEORGE J. HENRY, JR.,  
*Complainant.*

vs.

CITY OF LOS ANGELES,  
*Defendant.*

In Equity, No. A-87.

Depositions on behalf of Complainant in rebuttal, taken pursuant to adjournment before Grace M. Drayer, Notary Public, at the office of the York Manufacturing Company, York, Pennsylvania, on Saturday, May 29th, 1915, at 9 o'clock A. M.

GRACE M. DRAYER,  
Notary Public and Reporter.

*Filed Sept 16<sup>th</sup> 1915*

*Wm. S. Anthony Clerk*

*By Leslie S. Colyer Deputy Clerk*



IN THE UNITED STATES DISTRICT COURT,  
SOUTHERN DISTRICT OF CALIFORNIA,  
SOUTHERN DIVISION.

GEORGE J. HENRY, JR.,

vs.

THE CITY OF LOS ANGELES.

In Equity, No. A-87.

MET PURSUANT TO ADJOURNMENT at the office of Marcellus Bailey, Esq., Corner Fifth and F Streets, Washington, D. C., at the hour of three o'clock P. M., before A. M. Parkins, Notary Public in and for the District of Columbia.

PRESENT: Parties as before.

DEPOSITION OF MARCELLUS BAILEY.

Marcellus Bailey, a witness produced on behalf of complainant in rebuttal, being duly sworn, testifies as follows in answer to questions put to him by Mr. Blakeslee:

Q. 1. Please state your full name, age, residence and occupation?

A. Marcellus Bailey; age 75 years; residence Washington, D. C.; occupation Lawyer.

Q. 2. Have you among your clients one of the name of York Manufacturing Company, of York, Pennsylvania?

A. Yes, I have.

Q. 3. Can you state how many years, or since what earliest year, that concern has been one of your clients?

A. I cannot state exactly without reference to my

books, but I know that they have been clients since the early nineties.

Q. 4. Has that concern been your client since the year 1895?

A. Yes.

Q. 5. And as such client you have attended to matters for them in patent practice and patent law practice during that period of time?

A. Yes.

Q. 6. I show you a group of papers or documents in a jacket or envelope, and ask you if you know what the same are?

A. The papers in the jacket refer to a caveat in the name of Lamar Lyndon for some improvements in Electro-Mechanical Water-Wheel Governors, according to the title on the jacket. This caveat was prepared in my office.

Q. 7. Can you state who, or what client, ordered the preparation and filing of this Lamar Lyndon caveat?

A. My client, the York Manufacturing Company.

Q. 8. Can you state from those papers when such matter was placed in your hands by that client?

A. I can only tell by the letters.

Q. 9. Please refer to the same and state?

A. I find in my office file of the caveat a letter from the York Manufacturing Company, dated July 28, 1899, and enclosing description and claims of Lamar Lyndon's electro-mechanical water-wheel governor.

Q. 10. And how does this date conform with the time you first took up this caveat matter, as near as you can state?

A. I really can't tell you. I know when the caveat was filed and I know that I turned over the preparation of the case to a very competent patent agent in Washington at that time and now, Mr. J. S. Barker. He prepared the papers and they were filed from my office.

Q. 11. Please refer briefly to each of the papers and documents of this office file of yours in this Lyndon caveat matter, and state briefly what each of the same is and state when each was received by you and from whom, as far as you are able to state?

A. I will mark these papers consecutively by red colored numerals.

No. 1 is letter from York Manufacturing Company to me, dated July 28, 1899, and presumably received in due course of mail, enclosing description and claim of mechanical water-wheel governor invented by Lamar Lyndon of New York City.

No. 2 is the description of that invention, dated New York, July 24, 1899, and used as the basis of the caveat.

The paper marked No. 3 is blue print of the device described in the preceding paper, and said blue print was sent to me along with the description No. 2 by the York Manufacturing Company with their letter of July 28, 1899.

No. 4 is a drawing in lead pencil of the apparatus shown in No. 3, resembling it in many details. How it got into the file I don't know, or from whom I received it. It probably came with the rest of the papers, but that is mere surmise on my part; I can't remember after this length of time.

No. 5 is a letter addressed to me by the York Manufacturing Company and dated Aug. 24, 1899. On reading this letter, which I have seen for the first time since 1899, I find that the blue print marked No. 3 was enclosed in this letter, and therefore the lead pencil drawing No. 4 must have been the one that was enclosed in the previous letter of July 28th. This letter was received by me in due course of mail from the York Manufacturing Company.

Paper No. 6 is Mr. Barker's letter to me, dated Aug. 31, 1899, and sending the specification of the caveat which was filed.

No. 7 is a letter dated June 14, 1900, and addressed to me by Lamar Lyndon, and received by me in due course of mail.

No. 8 is a letter dated June 18, 1900, addressed to me by Lamar Lyndon and received by me in due course of mail.

Papers marked No. 9, No. 10 and No. 11 I am not able to identify, excepting that they are in the jacket of the caveat records.

No. 12 is a letter, dated June 11, 1900, addressed to me by the York Manufacturing Company, advising me that they were no longer interested in the Lyndon matter, and this letter also was received by me in due course of mail.

No. 13 is the jacket constituting my office file containing the papers 1 to 12, inclusive, relating to the caveat.

Q. 12. Where has this jacket, marked No. 13, with the papers Nos. 1 to 12, inclusive, been from the date you first took up this caveat matter of Mr. Lyndon's?



A. On the shelves in my office until delivered to yourself one week ago today and brought back to me intact this day.

Q. 13. The York Manufacturing Company, you have referred to in your recent answers, is the same York Manufacturing Company you had previously referred to as being your clients since 1895?

A. Yes, sir.

Q. 14. And the Lamar Lyndon you have referred to in several of your recent answers is the same Lamar Lyndon for whom you prepared and filed a caveat in accordance with your testimony?

A. Presumably; I never saw him and never met him.

BY MR. BLAKESLEE:

Complainant offers in evidence the jacket marked No. 13 by the witness in his testimony, containing the several papers marked 1 to 12, inclusive, by the witness in connection with his previous testimony, in one group and as one exhibit, and asks that the same be marked upon the jacket "Complainant's Exhibit Lamar Lyndon Bailey Caveat File".

BY MR. WESTALL:

The evidence is objected to as not the best evidence of the filing of the caveat and no proper foundation having been laid for the introduction of secondary evidence.

BY MR. BLAKESLEE:

In this connection we likewise offer in evidence a copy of the records of the United States Patent Office, duly certified by the Acting Commissioner of Patents, and pertaining to the expired caveat of Lamar Lyndon filed Oct.

13, 1899, for Improvements in Water-Wheel Governors, and ask that the same be marked "Complainant's Exhibit Certified Copy Lyndon Caveat."

Q. 15. I now hand you, Mr. Bailey, this exhibit certified copy Lamar Lyndon caveat, and call your attention to the drawing forming a part of this exhibit and ask if you are acquainted with the signature as it appears on the drawing under the inventor's name?

A. It is my signature.

Q. 16. As to the various signatures on the letters which you have discussed in your testimony appended to the corporate signature of the York Manufacturing Company, are you acquainted with those signatures so that you can state that they are the signatures of the parties purporting to have signed them?

A. I know perfectly well that the letters came to me in due course of mail from the York Manufacturing Company, and I know Thomas Shipley's signature perfectly well.

BY MR. BLAKESLEE:

Counsel may cross-examine.

#### CROSS-EXAMINATION BY MR. WESTALL.

XQ. 17. Do you find in this jacket, purporting to contain the files relating to the Lamar Lyndon caveat, all the papers that were turned over by you to Mr. Blakeslee, you say, a week ago?


A. Yes, as I remember.

*Examination closed*

DISTRICT OF COLUMBIA: SS.

A. M. PARKINS, being duly sworn, deposed and says that she is a citizen of the United States and a resident

of Washington, District of Columbia, U. S. A., and is a shorthand reporter and Notary Public; that the foregoing deposition of MARCELLUS BAILEY and the record in connection therewith was given and taken before and by me, stenographically and thereupon reduced to writing by me, at the office of Marcellus Bailey, Esq., Corner of Fifth and F Streets, Washington, D. C., commencing at the hour of three o'clock P. M. Saturday, May 29, 1915; that the said Marcellus Bailey was duly sworn by me in accordance with law before the commencement of his said deposition; that the foregoing record is a true, complete and full record of the said deposition of the said Marcellus Bailey and of all proceedings had in connection therewith; that the exhibits offered in evidence in connection with the taking of said deposition were received and duly marked and certified by me as noted in the record; that I am not interested in the event of the litigation in the proceeding in which said deposition was taken and the proceedings had in any manner, nor do I represent either of the parties thereto, nor am I connected with either of the parties thereto by blood or marriage or in any manner; and that the said deposition now certified by me, and the said exhibits duly certified by me, are now returned by me to I. Benjamin, Esq., Special Examiner in said proceeding at International Bank Building, Los Angeles, California; and that the complainant in said case was represented on the taking of said deposition and the proceedings in connection therewith by Raymond Ives Blakeslee, his solicitor and counsel, and the defendant was similarly represented by Joseph F. Westall, its solicitor and of counsel.

(Signed)  R. M. PARKINS.

Sworn to and subscribed before me this 2d day of June,  
A. D. 1915.

CHARLES E. RIORDAN,  
Notary Public District  
of Columbia.

*Notary's Certificate omitted*  
*Endorsements omitted.*



IN THE UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF CALIFORNIA  
SOUTHERN DIVISION.

GEORGE J. HENRY, JR.,  
Complainant.

against

CITY OF LOS ANGELES,  
Defendant.

In Equity, No. A-87.

Further proceedings on behalf of Complainant in rebuttal before Mary E. Woardell, Notary Public and reporter.

Met pursuant to adjournment at the office of Henry Escher, Jr., Esq., 26 Exchange Place, New York City, May 24, 1915, at the hour of two o'clock P. M.

Present: Raymond I. Blakeslee, Esq.,  
Solicitor and Counsel for Complainant;  
Joseph F. Westall, Esq.,  
Solicitor and of Counsel for Defendant.

It being found impossible to produce any witness under the stipulation and arrangement between parties in taking further proof on behalf of complainant at this time, adjournment is taken by consent, as was likewise found necessary at York, Pennsylvania, this adjournment being taken until the hour of ten o'clock A. M., Tuesday, May 25, 1915, at the office of M. E. Woardell, 31 Nassau Street, New York City, New York.

New York, May 25, 1915.

Met pursuant to adjournment at the hour of ten o'clock

A. M. at the office of M. E. Woardell, 31 Nassau Street, New York City.

Present: Counsel as before.

Counsel for Complainant states that he has vigorously endeavored to secure the presence of the witnesses as ~~per the list of witnesses as~~ per the list of witness incorporated in the stipulation under which these proofs are being taken. He is unable to produce a witness at this time. To indicate what the condition is at present with respect to the attendance of such witnesses, Counsel for Complainant states that the prospective witness Henry C. Meyer, Jr., has only this last few minutes returned from out of town, and Counsel for Complainant was unable to see him until the hour of 9:35 A. M., less than half an hour ago. He was in the midst of pressing matters which did not permit him to even discuss the question of testifying and his best promise was that he would talk with Counsel for Complainant over the phone tomorrow at noon and then arrange to testify. The prospective witness Thorburn Reid was attempted to be located at Bloomfield, New Jersey, over the phone yesterday afternoon and was reported out and Counsel for Complainant has written him requesting an immediate communication from him as to the time and place of taking his deposition.

Counsel for Complainant attempted to interview Mr. Knight, a prospective witness, yesterday, but found him to be in Court, and so on.

It will be necessary to adjourn these proceedings until the hour of two P. M., and possibly further to adjourn them until the attendance of a witness can be secured.

In view of the uncertainty as to the definite hour of proceeding as reflected in the above statements, it is agreed by Counsel that an adjournment will now be taken by consent until the hour of two P. M. this day, at this place, with the understanding that unless Counsel for Complainant phones Counsel for defendant at his Hotel by or before the hour of two P. M. this day to the contrary, the adjournment shall stand over to the hour of 10 A. M. tomorrow, May 26, 1915, at the same place and before the same officer.

Met pursuant to adjournment and further agreement of Counsel before M. E. Woardell, at the hour of four P. M., May 25, 1915, in the office of Messimer & Austin, 55 Liberty Street, New York City, New York. Present as before.

HILLARY C. MESSIMER, a witness produced on behalf of Complainant in rebuttal, being duly sworn that the testimony he gave was the truth, the whole truth and nothing but the truth, testified as follows in answer to interrogatories put by Mr. Blakeslee:

Q1. Please state your full name, age, residence and occupation?

A. Hillary C. Messimer; age, 41; residence Montclair, New Jersey; member of the firm of Messimer & Austin, Attorneys at law, at 55 Liberty Street, New York City.

Q. 2. Are you acquainted with Mr. Lamar Lyndon, a consulting engineer of the City of New York, New York, and the patentee of U. S. Letters Patent No. 695,220 for electro-mechanical water wheel governors?

A. I am.

Q. 3. How long have you known Mr. Lyndon?

A. I have known Mr. Lyndon since College days, some twenty to twenty-five years ago.

Q4. Was it at Stevens or Cornell?

A. At Stevens Institute.

Q5. Have you attended to any matters for Mr. Lyndon professionally?

A. I have, yes.

Q6. Have you ever done anything professionally for Mr. Lyndon in and about the subject matter and interests pertinent to said U. S. Letters Patent No. 695,220?

A. Yes.

Q7. Briefly what in so far as you can state with considerations of privileged communication?

A. In March 1910 Mr. Lyndon took up with me the question of the infringement of this patent by The Pelton Water Wheel Company and the Sturgess Engineering Department of the Ludlow Valve Manufacturing Company of Troy, New York. I wrote letters to both of these concerns calling attention to the infringement and for the next few months I had correspondence with the Companies, or their attorneys.

Q8. You are referring now to The Pelton Water Wheel Company of San Francisco, California?

A. I believe that is so, although my correspondence was with the New York office.

Q9. Can you produce copies of any letters transmitted by you to these concerns?

A. I can.

Witness produces copies of letters to The Pelton Water Wheel Company and Ludlow Valve Manufacturing Com-



pany, which purport to be dated respectively, March 24, 1910, and March 30, 1910, and it is stipulated that the same may be copied into the record at this point as part of the testimony of the present witness, these copies being reduced to a single copy because being identical in subject matter with the following exceptions: in the letter to the Sturgess Engineering Department, Ludlow Valve Mfg. Co., Troy, N. Y. under date of March 30th, in substitution of the words "which you are advertising in this week's issue of the Electrical World" appearing in the letter to Pelton Water Wheel Company of March 24th, appears the words "which you are putting out," and only the full addresses of the respective letters being given, and both having been signed by the witness as attorney for Lamar Lyndon.

"March 24, 1910.

The Pelton Water Wheel Co.,  
90 West St., City.

Gentlemen:

My client, Mr. Lamar Lyndon, has requested me to bring to your attention the fact that the water wheel governor which you are advertising in this week's issue of the Electrical World is an infringement of some of the claims of patent No. 695,220, granted to him March 11, 1902, particularly claims 6 and 7.

While Mr. Lyndon is not seeking for litigation, nevertheless he feels that he must protect his rights under this patent, and therefore I bring it to your attention in order that you may investigate the matter and advise me whether you propose to discontinue the infringement or stand suit.

I will of course give you a reasonable time to investigate before I take action.

Yours very truly,

Hillary C. Messimer

Attorney for Lamar Lyndon.

Mk

Q10. Did you receive any response from either of these addresses to the letters so sent them?

A. In the usual course of business I received a letter dated March 25, 1910, addressed to me at my office, 56 Pine Street, my address at that time. This letter is signed by The Pelton Water Wheel Company, J. V. Kunze, Manager Atlantic Department. Under date of April 14, 1910, I received a letter from Mr. Frank C. Curtis, of the firm of Mosher & Curtis, Patent Attorneys, at Troy, New York, saying that my letter of March 30, 1910, to the Ludlow Valve Manufacturing Company had been turned over to him, and that he was investigating the matter.

IT IS STIPULATED between Counsel that these copies may be copied into the record at this point, unable in evidence with full force and effect as if the originals were produced, which likewise pertains to the copies heretofore spread on the record.

THE PELTON WATER WHEEL COMPANY  
INCORPORATED  
HYDRAULIC ENGINEERS

New York March 25, 1910

Atlantic Department,  
West St. Building, 90 West St.,  
New York, U. S. A.  
J. V. Kunze, Mgr.

Hillary C. Messimer, Esq.,  
56 Pine Street, City.

Dear Sir:

We have your favor of the 24th and, in reply, would say that we were not aware that we were infringing on Mr. Lyndon's patent. We will look into

the matter and advise you after we have made an investigation.

Yours very truly,  
THE PELTON WATER WHEEL CO.  
J. V. Kunze  
Manager Atlantic Dept."

MOSHER & CURTIS  
COUNSELLORS AT LAW,  
PATENTS AND PATENT CAUSES  
Rooms 303-305 Cannon Place  
Corner Broadway & Second Street  
Troy, N. Y.

April 14, 1910.

Mr. Hillary C. Messimer,  
New York City

Dear Sir:—

Your letter of March 30, 1910, to Sturgess Engineering Department of Ludlow Valve Mfg. Co., Troy, N. Y., has been handed to me for investigation.

I have been investigating this matter, and will report to you further as soon as I have completed the investigation.

Very truly yours,  
Frank C. Curtis"

Q11. Did further correspondence ensue between you and these parties last referred to in this matter?

A. Yes. On May 6, 1910, I wrote to The Pelton Water Wheel Company and called attention to the fact that they had had ample time to investigate the Lyndon water wheel governor patent and that I would be glad to hear from them in regard to it. On the same day I wrote a similar letter to Mr. Curtis.

Witness produces copies of these letters, and IT IS

STIPULATED between Counsel in keeping with the above stipulation that copies of these copies may be spread on the record at this point.

“May 6, 1910.

Pelton Water Wheel Co.,  
90 West St. City.

Gentlemen:

On March 24th I wrote to you in regard to your infringement of Mr. Lamar Lyndon's Water Wheel Governor patent, and you replied that you would look into the matter and advise me after you had made an investigation.

It seems to me that you have had time to come to some conclusion in this matter, and as Mr. Lyndon is objecting to the long delay, I must ask you to let me hear from you in regard to it.

Yours very truly,

Mk

Hillary C. Messimer”

“May 6, 1910

Frank C. Curtis, Esq.,  
Broadway & 2nd St.,  
Troy, N. Y.

Dear Sir:

On April 14th you wrote me that you were investigating the Lyndon Water Wheel Governor patent referred to in my letter of March 30th to the Sturges Engineering Department of the Ludlow Valve Manufacturing Company.

I would be glad to hear whether you have reached any conclusion.

Yours very truly,

Mk

Hillary C. Messimer”

(Witness continuing) Under date of May 7, 1910 I received a reply from The Pelton Water Wheel Company by J. V. Kunze, Manager Atlantic Department and under date of May 9th I received a reply from Mr. Curtis.



Under date of June 9, 1910 I received a letter bearing typewritten signature of The Pelton Water Wheel Company in regard to this patent, and under date of June 22nd I received a letter from Mr. Curtis regarding the same matter. On June 24, 1910 I wrote to Mr. Curtis, and since that time have had no correspondence with either of the Companies or their representatives on this subject matter.

Q12. Did any of this correspondence with these two concerns, to your knowledge, eventuate in any settlement of the claims of infringement made, or any other outcome satisfactory to Lyndon?

MR. WESTALL: Counsel for defendant understood from the stipulation that was made that these letters referring to this correspondence should be put in evidence, that all the correspondence showing completely the transactions concerning which the letters so written should be received, and unless this is done objection will be made that the correspondence is not complete and does not fully show the transaction.

MR. BLAKESLEE: The stipulation relates to such correspondence as we wish to offer in connection with this deposition, and if it was good as to the whole it was good as to any part. We do not intend to encumber this record wholly with a large number of folios of correspondence which cannot establish any of the issues in the case, and are taking this deposition to show that the patentee Lyndon, assignor of the patent in suit, through the present witness, corresponded with and notified these various parties in respect to the patent in suit. These several letters have been open to the in-

spection of the Counsel for defendant and he is welcome to any information he may gather therefrom.

A. I have no knowledge what happened after the date of the last letter that I mentioned.

Q. 13. So far as your knowledge goes, did the correspondence referred to eventuate in any transaction between your client, Mr. Lyndon, and these parties, if you feel at liberty so to state?

A. It is obvious from the correspondence itself that no settlement or anything else took place prior to the date of the last letter, and I have stated that I have no knowledge as to what happened subsequent to that date.

Q. 14. Have you knowledge or records of any further correspondence with these parties, or with any other parties setting forth, or relating to, infringements of the Lyndon patent under consideration as emanating from your office or efforts?

A. No.

Q. 15. Did you make any further attempts to obtain recognition of the Lyndon patent subsequently on behalf of Mr. Lyndon?

A. That would involve my looking through all of our correspondence files subsequent to July, 1910, to ascertain whether there were any letters; to the best of my recollection there were none.

Q. 16. Were you retained or employed by Mr. Lyndon subsequently to this period of 1910 to carry forward such matters?

A. I was not.

Q. 17. Now were you retained or employed by Mr.

Lyndon to commence any litigation under the Lyndon patent in question?

A. I was never retained by Mr. Lyndon and I can hardly say that I was employed by him. Mr. Lyndon was doing quite a little expert work for me in connection with patent cases for which he was being paid by my clients, and in addition to this I had taken a financial interest in two or three of Mr. Lyndon's inventions. He thought that his Pelton water wheel governor patent was an important one and that it was being infringed. As a matter of friendship for Mr. Lyndon I took the matter up with these two concerns with the idea that a settlement might be brought about by correspondence, and that if no settlement was reached that Mr. Lyndon might at some future time be in a financial position to push litigation against these companies.

Q. 18. Do you know of your own knowledge whether during the year 1910 Mr. Lyndon was financially able to commence and rigorously prosecute suits for infringement of said Lyndon letters patent?

A. To the best of my knowledge and belief he was not.

CROSS-EXAMINATION BY MR. WESTALL.

XQ. 19. When did you first represent Mr. Lyndon in any manner in notifying alleged infringers, or in carrying on correspondence with relation to said patent?

A. March 24, 1910.

XQ. 20. And to your knowledge had any of this correspondence been carried on prior to that time?

A. I have in my possession a letter from The Pel-

ton Water Wheel Company to Mr. Lyndon, dated in 1908. This letter was furnished to me by Mr. Lyndon and it indicates that there had been correspondence prior to 1910. Further than this I have no knowledge.

Witness produces such letter and IT IS STIPULATED that the same may be offered in evidence as of the date given and as signed by Edward L. Brayton, and having been written by said Edward L. Brayton to Mr. Lamar Lyndon, the patentee of the patent in suit, and mailed to him at the date of the letter, and the same is offered in evidence as Complainant's Exhibit Pelton Company 1908 Letter.

Letter dated March 20, 1908, received and marked "Complainant's Exhibit Pelton Company 1908 Letter."

XQ. 21. When did Mr. Lyndon turn over the letter just referred to by you to you?

A. He enclosed it with a letter to me dated May 18, 1910.

XQ. 22. To your knowledge did Mr. Lyndon ever institute suit against any of the alleged infringers of said patent?

A. I understood that there had been a suit filed against the Allis-Chalmers Company prior to the time I had the correspondence which has been read into the record.

XQ. 23. Where did you get that understanding?

MR. BLAKESLEE: Object to the same as it calls merely for hearsay evidence and that unless it was within the knowledge of the witness, and he was in personal touch with the suit or advised of its commencement, pendency or prosecution, that the question calls



for merely a conclusion and guess and is entirely hearsay in nature.

A. It is somewhat difficult for me to say how much actual knowledge I had as to such suit. How much was hearsay at that time and how much was recollection at the present time, I cannot determine in my own mind, all that I can say is that my recollection is that there was such a suit.

XQ. 24. How did that suit terminate, if you know?

MR. BLAKESLEE: Same objections.

A. As far as I know the suit never did terminate.

XQ. 25. Where was that suit instituted?

MR. BLAKESLEE: Same objections.

A. That I do not know.

XQ. 26. When was that suit started?

MR. BLAKESLEE: Same objections.

A. That I do not know, except that it was a couple of years prior to the date of my correspondence.

XQ. 27. Did Mr. Lyndon ever tell you that he had instituted such a suit?

A. My recollection is that he did.

XQ. 28. And did he ever tell you of the result of such suit?

MR. BLAKESLEE: Same objections and as calling for a conclusion.

A. I never heard of there being any result.

XQ. 29. And will you say he never told you of the result in such suit?

MR. BLAKESLEE: Same objections.

A. I mean by my last answer that I have no recollection of Mr. Lyndon or any one else ever telling me of any result of that suit.

XQ. 30. As the representative of Mr. Lyndon, and as attorney conducting the correspondence threatening other alleged infringers, were you not interested in knowing the status of that case, and whether or not it had terminated?

MR. BLAKESLEE: Objected to as stating a conclusion and also calling for a conclusion, and not the proper method of proof and not cross-examination.

A. Undoubtedly at the time of the correspondence I was quite fully advised of the situation; that, however, was five years ago and I had not given this matter any thought for several years until a few hours ago when Mr. Blakeslee asked me to testify about these letters. At the present time my recollection as to the Allis-Chalmers suit is very hazy. I might even be mistaken that there actually was a suit.

MR. BLAKESLEE: We ask that the answer be stricken out on each ground of objection made, and on further ground that the witness apparently has no personal knowledge of any of the matters concerned.

XQ. 31. Have you among any of the letters to which you have referred this afternoon, or among your files anywhere, any information by which you could determine definitely the title of the case, where it was commenced, or what the result of such suit was?

MR. BLAKESLEE: Same objections, as not cross-examination, being apparently merely a fishing excursion. This question furthermore is manifestly not cross-examination, and also from the previous testimony of the witness does not come within his definite knowledge and the witness is notified that he need not answer the question unless so ordered.

A. So far as I am personally concerned I have no objection to answering your question, but as I understand that Complainant's Counsel is instructing me to decline to answer this question until ordered to do so by the Court, I will, of course, follow his instructions and permit him to raise any question that he desires with the Court.

Counsel for Complainant states that he has no objection to any knowledge of the witness on this point being put in the record, but he does object to the record being uselessly extended where the testimony is not predicated upon knowledge, the witness having already testified that he has no actual knowledge that any such suit was ever commenced and that all he possesses is a mere feeble, semi-recollection that he was told something about some such suit. It being not proper cross-examination we object to the witness being burdened with any exhaustive search of all his records in order to obtain verification of this possible matter of dim recollection.

Counsel for Defendant, in view of Counsel's statement that he has no objection to the witness supplying any positive or definite knowledge, and his statement that his objection is mainly based upon the hazy nature of the witness' recollection, we repeat the question.

Counsel for Complainant: The witness has stated that he does not know whether any such suit was ever commenced, and we stand upon that answer as a proper predication of our instructions that he need not further testify along this line, unless so ordered.

Counsel for Defendant: The question is directed to bringing out matters which will refresh the recollection

of the witness, in order that he may testify positively and definitely, and unless Counsel wishes to withdraw his statement that his objection was based merely upon the haziness of the witness' recollection, I believe the question should be answered.

Counsel for Complainant: The objection and statement are repeated. It is further stated of record that this testimony cannot in any measure be the best testimony for if any such suit was ever commenced, the record of the Court would be the best evidence, and the same are open to defendant, if he wishes to search them. This witness has said that he never had any part in any such suit.

Counsel for Defendant suggests that if the witness answers the question he will obviate any objection as to the Court records by securing copies of the original records and introducing them in evidence, and the question is only aimed to give Counsel information which may enable the objection to be overcome.

Counsel for Complainant: We will ask Counsel to pass on for further questions.

Witness: I can only repeat that I am entirely willing to answer the question but feel myself bound by the instructions of the Counsel.

XQ. 32. If ordered by the Court to answer the question, will you say that you have among your files information which would enable you to answer the question?

Counsel for Complainant: Same objection and statement to the witness that this is manifestly a mere repetition of the question.



A. Same answer.

XQ. 33. Do I understand then that you decline to look into your files, or make any search in order to give information which would lead to the discovery of the record of this case in which Mr. Lyndon brought suit against the Allis-Chalmers Company?

Counsel for Complainant: Objected to as assuming a fact not testified to by the witness, namely, that any such suit was ever brought, and upon each of the objections heretofore made, and furthermore objected to as having already been answered by the witness.

A. No, I hardly meant that. I felt bound by the instructions of Counsel not to answer the question. As far as searching my records is concerned I am entirely willing to do so.

XQ. 34. Have you among the correspondence with The Pelton Water Wheel Company to which you have referred on your direct examination, any letter which refers to this suit against the Allis-Chalmers Company?

A. No, except that in the letter of June 9th from The Pelton Water Wheel Company you refer to the fact that they had the matter of this infringement up with the Allis-Chalmers Company.

XQ. 35. Have you any other letter received along about the time in which the suit was mentioned?

A. Yes.

XQ. 36. Will you please produce that letter?

A. I have a letter dated May 20, 1910, from the Woodward Governor Company to Mr. Lyndon. This letter was turned over to me by Mr. Lyndon and I replied to it under date of May 24, 1910. In both of these letters the Allis-Chalmers suit is mentioned.

MR. WESTALL: The defendant offers in evidence the two letters referred to by the witness and assumes that the same stipulation with regard to their being copied in the record will be made.

“WOODWARD GOVERNOR CO.

Manufacturers of

Governors for Water Wheels

240-250 Mill Street,

Rockford, Ill., May 20-10.

Mr. Lamar Lyndon,  
New York, N. Y.

Dear Sir—

In 1908, we had some correspondence with you in regard to your patent No. 695220. At that time you said that you had suit in Court against the Allis-Chalmers Co., for infringement of this patent. We would like to inquire whether this suit has been decided or settled in any way so that you now know whether your claims can be sustained.

Very truly yours,

WOODWARD GOVERNOR CO.

Per E. E. W.”

“May 24, 1910.

Woodward Governor Co.,  
Rockford, Ill.

Gentlemen:

Mr. Lamar Lyndon has turned over to me your letter to him of the 20th inst.

Shortly after the suit was brought against the Allis-Chalmers Company on Mr. Lyndon's patent No. 695,220, his relations with that company became such that the suit was not pushed.

Recently Mr. Lyndon placed this matter in my hands for the purpose of bringing suits against two other concerns for infringing the patent, and these concerns are now looking into the matter with a view to determining what action they will take.

My instructions from Mr. Lyndon are that if these concerns do not make a prompt settlement, I am to proceed with the suits and push them to a speedy hearing.

Yours very truly,

Mk

Hillary C. Messimer."

XQ. 37. Have you any other letters among the correspondence which you have referred to this afternoon, either among the letters actually mentioned, or other letters which refer in any way to said suit?

A. No.

XQ. 38. Do you know the attorney who represented Mr. Lyndon in the suit brought against the Allis-Chalmers Company?

A. I believe it was Harold Binney, now deceased.

XQ. 39. I understand you to say that you wrote the letter dated May 24, 1910, to the Woodward Governor Company in answer to their letter of May 20th, is that correct?

A. That is correct.

XQ. 40. I notice that you say in said letter that "Shortly after the suit was brought against the Allis-Chalmers Company on Mr. Lyndon's patent No. 695,220, his relations with that company became such that the suit was not pushed." Will you please state what you meant by that paragraph?

A. Some time about the year 1908 or 1909 Mr. Lyndon entered into a partnership with Mr. Louis Duncan under the firm name of Duncan & Lyndon. Dr. Duncan was a very prominent electrical engineer and he was employed very actively by the Allis-Chalmers Company as expert for them in their patent cases. It was because

of his partner's relations with the Company, as I recall it, that he felt embarrassed to press his litigation against them.

XQ. 41. Have you any definite knowledge that that was the case, or are you only surmising that that may have had something to do with his decision?

A. My recollection is that that was what I meant by the statement in my letter.

XQ. 42. And your recollection is positive is it upon that point?

A. My recollection is positive that that is what I meant by the statement in the letter. I, of course, cannot say as to whether that was the reason why Mr. Lyndon did not press his suit, but it is the reason he gave me and the reason I had in mind when I wrote that letter.

XQ. 43. Did you ever examine the files of that case to see what was done, or did you ever see the answer that was put in by the Allis-Chalmers Company?

A. I believe I examined the answer in the case.

XQ. 44. Did you ever advise Mr. Lyndon to bring suit against the various parties with whom you corresponded relative to alleged infringement of said patent?

A. I did.

XQ. 45. When you stated that to your knowledge Mr. Lyndon was not able financially to commence suits, you had not at that time in mind this particular suit to which you have referred, had you?

Counsel for Complainant: Objection is made that the question is not based upon direct examination, and therefore not proper cross-examination, because the question in direct was limited to the year 1910.



A. I had in mind that Mr. Lyndon at the time of our correspondence with these Companies, and after the failure to bring about any indication of settlement, was not in a financial position to indulge in the luxury of patent litigation.

XQ. 46. You did not have any intimate knowledge of Mr. Lyndon's financial condition at the time you have mentioned, did you?

A. Yes, I think I did. I had assisted Mr. Lyndon financially in connection with some of his inventions.

XQ. 47. And did you know what his income was?

A. No, of course, I did not know what his income was, but the office of Duncan & Lyndon was in the same building as mine, and both Lyndon and Duncan were personal friends of mine, and I knew in a fairly accurate way what business they were both doing.

XQ. 48. You had no accurate knowledge as to how much money or real estate Mr. Lyndon had at any of the time during your acquaintance with him, and particularly the time about which you have testified?

A. Mr. Lyndon is a genius; like all geniuses he is peculiar; he is either stone broke, or he is a millionaire. At this particular time he was stone broke; that is all I can say as to his financial condition.

XQ. 49. Did you ever know him at any time when he was not stone broke?

A. Yes.

XQ. 50. And when was that?

A. I believe that for the last year or so he has been quite successful financially, although I have not seen as much of him as I did previously because he is not in New York much of the time.

XQ. 51. Now you have referred to two letters, one of which was received by you on June 9, 1910, and the other was a letter received from Mr. Curtis in regard to the same matter, dated June 22, 1910: Will you please produce those letters?

A. Yes. (Witness produces letters).

Counsel for Defendant: We offer in evidence the two letters referred to by the witness and ask that they be copied into the record under the stipulation.

“THE PELTON WATER WHEEL CO.  
INCORPORATED  
HYDRAULIC ENGINEERS

Atlantic Department,  
West St. Building, 90 West St.  
New York, U. S. A.

J. V. KUNZE, Mgr.

New York, June 9, 1910.

Dictated J.V.K.

Hillary C. Messimer, Esq.,  
56 Pine St., City.

Dear Sir:

Referring to your letter of March 24th regarding Lamar Lyndon's claim that we were infringing some of the claims of his patent No. 695220 dated March 11, 1902, and particularly claims 6 and 7: would say that we have investigated this matter very thoroughly during the past two years and have conclusive evidence that devices covering claims 6 and 7 as specified in Mr. Lamar's patent have been used since 1896, or practically 5 or 6 years before his patent was granted to him; furthermore, the device which we use bears absolutely no resemblance to the device specified in his patent, and if Mr. Lamar would care to call at this office we will be very glad to show him some of the data which we have

on the subject. We took the trouble several years ago to have an investigation made abroad, and have also had the matter up with the I. P. Morris Co. and the Allis Chalmers Co.

Yours very truly  
THE PELTON WATER WHEEL CO."

"FRANK C. CURTIS,  
Counsellor at Law,  
Patents and Patent Causes,  
Rooms 303-305 Cannon Place  
Corner Broadway & Second Street  
Troy, N. Y.

June 22, 1910.

Mr. Hillary C. Messimer,  
New York City.

Dear Sir:—

I am not yet prepared to make final report of the investigation of the Lyndon patent 695,220, concerning which you wrote the Sturgess Governor Engineering Department of the Ludlow Valve Mfg. Co., of this City, March 30, 1910; but, in order that you may know that the matter is having my attention, I would refer you to Figs. 1 and 2 of French patent No. 261,029 of October 24, 1896, and to Swiss patent No. 17,536, dated December 15, 1898.

I presume you are aware that in the Sturgess Governor construction, the by-pass valve is not responsive to movement of the gate in both directions, but merely to a closing movement of the gate wherein it differs from the Lyndon construction.

I will write you further in the matter when I have completed my investigations.

Very truly yours,

Frank C. Curtis."

REDIRECT EXAMINATION BY MR. BLAKESLEE:

RDQ. 52. You do not know of any time at which Mr. Lyndon was a millionaire, do you?

A. I, of course, was speaking figuratively. What I meant was that if Lyndon had any money at any time he showed it very plainly, but most of the time he was perfectly frank in admitting that he was broke.

RDQ. 53. Did you ever know of him having sufficient funds at any time to prosecute the suit for infringement of letters patent and carry it on fully and completely?

A. I cannot say as to that. There were periods when I did not see Lyndon for several years at a time.

RDQ. 54. But during the periods that you had any knowledge of Lyndon's finances, did you ever know of his having sufficient funds to carry on such a suit?

A. No.

RDQ. 55. Of course he may have had but you did not know it?

A. Yes.

RDQ. 56. But you did not know it?

A. No.

#### RECROSS-EXAMINATION BY MR. WESTALL:

RXQ. 57. You did not know at that time that he did not have sufficient funds to start suits, did you?

A. I of course did not have positive knowledge on the subject.

Hillary C. Messimer.

Met pursuant to adjournment at the office of Mortgage Realty and Investment Company, at the hour of 10.45 A. M., May 26, 1915, before the same officer present as before. An adjournment was then taken by consent



2597    2    add "Met at that place pursuant to adjournment at the hour of 11:15 A. M., May 21, 1915, before Lloyd Thompson, a master in Chancery of the State of New Jersey, and duly authorized and commissioned to administer oaths,  
Present as before."



to the office of Earle A. Merrill, Esq., 121 Prospect Street, Westfield, New Jersey.

EARLE A. MERRILL, a witness produced on behalf of complainant, in rebuttal, being duly sworn, testifies as follows in answer to interrogatories put by Mr. Blakeslee:

MR WESTALL: Before proceeding with the examination of Mr. Merrill, Counsel for defendant would like to have it appear of record that he was notified by Counsel for complainant on the way over to Westfield this morning that through inadvertence the witness Hillary C. Messimer, whose deposition was taken yesterday, was not sworn. I should like now to ask the Notary or stenographer, Miss Woardell, whether or not that is a fact?

By the Notary: It is a fact.

Counsel for defendant states that inasmuch as it was the understanding of all the parties present, including the witness, that he was testifying under oath, and inasmuch as the time is very limited and we have come a great distance to take these depositions, Counsel for defendant offers to stipulate that all the testimony or all the statements made by Mr. Messimer be considered as though they were properly sworn to, or that the deposition when transcribed be submitted to Mr. Messimer and he be permitted to swear to the truth of the statements there made, with the same force and effect as though he had been sworn before making the statements contained therein or giving such deposition.

BY MR. BLAKESLEE: We do not agree in all respects with the statement of Counsel and the matter of

his proposed stipulation will be taken under consideration.

BY MR. WESTALL: Do I understand Counsel for complainant to say that he does not wish to agree to such stipulation?

BY MR. BLAKESLEE: The record speaks for itself.

BY MR. WESTALL: I will ask Counsel what his intention is in regard to the letters forming part of the deposition of Mr. Messimer, which it was agreed might be copied into the record. Is it Counsel's decision that the witness having produced the letter and identified them, not being sworn, that such letters should not be considered as evidence?

BY MR. BLAKESLEE: Counsel will take that matter under consideration also.

Q. 1. Please state your full name, age, residence and occupation, Mr. Merrill?

A. Earle A. Merrill, Lawrence avenue, Westfield, New Jersey; 47; lawyer.

Q. 2. Have you always resided in the City of Westfield, New Jersey?

A. It is a Town. No, I have resided here thirteen years.

Q. 3. And before that time where did you reside?

A. New York City.

Q. 4. What was your occupation in New York City prior to removing to Westfield, New Jersey?

A. For some years I had been manager of the New York office of McIntosh, Seymour & Co., engine builders.



Q. 5. Where was that concern located?

A. Its works were at Auburn, New York.

Q. 6. How long did you represent that Company in New York prior to removing to Westfield, New Jersey?

A. I came here in 1902; about five years.

Q. 7. During your representation of McIntosh, Seymour & Co. in New York, did you have any dealings with a concern known as the American Trading Company?

A. Yes.

Q. 8. What did those dealings concern, briefly?

A. The American Trading Company sold our engines in Japan and the transactions went through the New York office of McIntosh, Seymour & Co.

Q. 9. Did you have any dealings with any one in particular connected with the American Trading Company during those times?

A. Prior to Mr. Lyndon's taking charge of the engineering department I think our dealings were almost exclusively with Mr. Thomas Eddy. After Mr. Lyndon took charge they were sometimes with Mr. Eddy and sometimes with Mr. Lyndon.

Q. 10. Who is the Mr. Lyndon you have referred to in your last answer?

A. Lamar Lyndon, the engineer of the American Trading Company.

Q. 11. When did you first meet Mr. Lyndon?

A. Upon his return from Japan in the spring of 1898.

Q. 12. Do you know what he was doing in Japan?

A. Only in a general way; he had charge, as I under-

stand it of the steam engine work for the American Trading Company.

Q. 13. And how soon after his return from Japan in the spring of 1898 did you meet him?

A. Probably immediately after his return as we were then negotiating for the sale of a number of engines to the Tokio Electric Light Company.

Q. 14. Approximately what month would you give as defining the time mentioned in your last answer?

A. I don't think I could say more than it was in the early spring. We had, as I recall it, about six months in which to ship the engines and it is my recollection that the engines were shipped in the fall.

Q. 15. How frequently did you meet Mr. Lyndon between the spring and fall of 1898?

A. While the negotiations were in progress I probably met him several times a week. Thereafter I probably met him at least once a week, as I kept in close touch with all the expert houses and I also met him not infrequently socially.

Q. 16. And what was Mr. Lyndon's position with the American Trading Company during these times?

A. He termed himself engineer, but seemed to have entire charge of the Japanese export business in mechanical appliances.

Q. 17. Do you remember anything about Mr. Lyndon's living arrangements or domestic arrangements during the summer of 1898?

A. Yes, quite clearly.

Q. 18. What do you remember in that connection?

A. I recall that he brought back from Japan a great

many Japanese objects of art and curios, tapestries, vases, &c. In fact, his rooms looked something like an Oriental art dealer's room. He had been accustomed to a number of Japanese servants and apparently found it difficult to adapt himself to living without servants, and often joked about his having to tie his own shoe-strings and brush his own clothes, &c.

Q. 19. And his income at that time was limited, am I to understand?

Counsel for defendant: Objected to as assuming something that has not been testified to by the witness, and as leading.

A. I do not know what his income was, but I do know that he had not been here long before he told me he must readjust his mode of life, because he was spending money too freely, and he thereafter moved to less expensive quarters.

Q. 20. What, if any, training and experience have you had in mechanical and technical lines?

A. In college I specialized in physics. I was electrical engineer for the New York Edison Company and the Edison General Electric Company, and also took a year of Post-Graduate work in electrical and mechanical engineering at Cornell. I was electrical engineer for a short period for J. G. White & Co. and the Pierson Miller Engineering Company. Thereafter I took charge of the New York Office for McIntosh, Seymour & Co., and in that position was constantly in touch with electrical and mechanical work.

Q. 21. During the summer of 1898 when you were in such frequent contact with Mr. Lyndon, did you ever

discuss with him general mechanical and electrical questions and any matters of mutual interest?

A. Yes, frequently.

Q. 22. Did you ever discuss with him during that period of time the subject of water wheels and water wheel governors?

A. Yes.

Q. 23. How did you come to discuss these subjects at that time?

A. Mr. Lyndon was of an inventive turn of mind and not infrequently discussed with me possible inventions. Furthermore, at that particular time, competition of water powers was increasing and as engine manufacturers we were interested in possibilities of water wheel control, and furthermore, difficulties were being met with in the parallel operation of synchronizing of alternators, and we were ourselves interested in the design of an engine governor which should meet certain rather difficult requirements, and some of these problems were much the same in the engine business as in the water wheel business.

Q. 24. Do you remember any particular discussion, or the discussion of any particular matter pertaining to water wheel governing as occurring between yourself and Mr. Lyndon during this period of time, and if so, what?

A. Mr. Lyndon was then at work on a device which should be auxiliary to the usual form of water wheel governor, and which was intended to make the operation of the controlling gate valve sensitive, positive and accurate, these conditions not being properly met by existing water wheel governors.



Q. 25. What did Mr. Lyndon disclose to you in this connection during this period of time mentioned?

A. I would not term it a disclosure in the ordinary use of that term. We discussed the deficiencies in water wheel governors and various methods of overcoming their faults, and in particular a device which he seemed to think would revolutionize water wheel governing.

Q. 26. Did he tell you about such a device?

A. Yes, and made sketches and we discussed whether it would work or not, and whether it would be successful or not.

Q. 27. Please state, briefly, what Mr. Lyndon told you about such proposed water wheel governor, and what he said as to its proposed construction and operation, and of course quote his language, if you are now able to do so; if you cannot do so, please give us a summary of what he told you, following as closely as you can his words.

A. I cannot give the language of my questions or his replies, our talks were too discursive and intermingled with discussions of other matters. I recall clearly the purpose of his device and the general means he proposed to adopt to accomplish such purpose.

Q. 28. Will you please then briefly state what the purpose was, and what such general means were, as told you by Mr. Lyndon at this period of time?

A. The water wheel governor of that period depended for its operation upon changes in speed, and these changes in speed might be induced by changes in loads, or changes in head or changes in the velocity of the water, or any combination of the above. On account of inertia problems it was very difficult to make a governor,

—in fact impossible, depending solely upon mechanical devices which should adjust the gate valve accurately to changes in load without overrunning or underrunning, as the case might be. As a result there would be wide changes in voltage and a considerable period would elapse before the controlling gate valve would be brought to the position required by the change in load. In fact, it often occurred that the valve would stop at a point at which the change in load had not been exactly compensated for and the speed and resulting voltage would therefore be too high or too low. Mr. Lyndon's idea was that if he could overcome the inertia problems, the question of regulation would be immensely simplified. His idea was to provide a by-pass which should be electrically controlled. By means of this by-pass the inertia effects would be absorbed in the diversion of the water through the by-pass, in order to compensate for the change in load, and thereby leave the governing mechanism to control merely the change in speed. For this purpose it was necessary that the electrical control should be abnormally sensitive, and he intended to accomplish this by driving a dynamo from the main shaft, which said dynamo should have the saturation of its fields below what is termed the knee of the curve. In this condition a very small increase in excitation due to a very slight increase in speed would greatly increase the output of the dynamo, and this output or current passed through certain solenoids, which in turn through a lever mechanism operated the by-pass valve. By this means the by-pass valve was opened instantly upon a change in speed. The main gate valve mechanism was then brought into operation and adjusted the opening of that

valve for the increased or decreased flow of water required by the change in load, and thereafter the by-pass mechanism operated in such a way as to shut off the by-pass valve. This closing of the by-pass valve was gradual so that the inertia effects due to shutting off the water should not disturb the flow through the main valve, and was in turn controlled by a dash pot arrangement. Furthermore, this by-pass arrangement could be adjusted so that the time required for closing the by-pass could be varied and could be pre-determined when the by-pass mechanism was out of operation. The main valve controlling the main flow through the water wheel was practically locked in position. The general purpose was to make the position of the main valve determined by the change in load and speed, leaving the by-pass arrangement to take up the disturbing effects due to the inertia of starting or stopping a volume of moving water. I believe it also took care of variations in head, such variations affecting also the inertia problems. To do this the electrical device had to act quickly and positively and throw the by-pass valve open quickly on the one hand, and on the other hand, must close the by-pass valve gradually.

Q. 29. What was the direction of movement of the by-pass valve to be in respect to the movement of the water wheel gate when the water wheel gate moved to admit more water to the wheel, or when it moved to admit less water to the wheel?

A. With an increase in load more water was required to flow through the main valve, but the immediate effect of opening the main valve wider would be to reduce the power of the water wheel momentarily, because the

water would run away from the wheel before the inertia effect could be so far overcome as to permit the larger volume of water required to flow, so that when the load increased, as I recollect it, the by-pass valve would compensate for the temporary loss of water, and then in turn would compensate again for the inertia effect of a suddenly accelerated flow which would tend to increase the speed above that required by the increase in load. In other words, with an increase in load there might be a tendency first to decrease the speed below normal and then to increase it above normal, and the by-pass arrangement was intended by working in the opposite direction to compensate for both of these effects, thus permitting the amount of water required by the variation in load through the main valve to be practically constantly effected without the disturbances incident to the starting or stopping of a large volume of water. The effect was as if the by-pass valve controlled a small auxiliary body of water which was so close to the water wheel that it was without inertia effects.

Q. 30. And when the water wheel gates moved in a closing direction, what did the by-pass valve do with respect to this flow of water, which you have termed as auxiliary?

A. When the load decreased it was necessary to diminish the flow of water through the main valve and to do this it was necessary to close the main valve, but before this could be accomplished the water must be diverted in order to instantly reduce the volume, and for this purpose it is my recollection that the by-pass was opened.

Q. 31. And now when the water wheel gates moved



in an opening direction what did the by-pass valve do with respect to this auxiliary flow of water?

A. In an opposite direction of course, the flow must be increased, and to instantly supply the amount of the increase the part of the water flowing through the by-pass must be diverted to the main valve.

Q. 32. So that upon a closing movement of the gate there would be a subtraction from the flow to the water wheel gate by means of the by-pass, and upon an opening of the gate there would be an addition to the flow of water to the water wheel gate due to the movement of the by-pass valve controlling the flow through the by-pass, is that correct?

A. Yes. I might add this: It is my recollection that this involved a constant small waste of water through the by-pass but that this was a small amount and considered negligible.

Q. 33. And after the by-pass valve had executed this initial inverse movement, or movement inverse or opposite to that of the movement of the water wheel gate, what transpired with respect to the by-pass valve?

A. The speed control was so sensitive that the by-pass valve itself, being controlled by a dash-pot so that it would not overrun when the flow of water was such through the main valve as to keep the speed within predetermined limits just where it was before the change in load took place, the by-pass valve mechanism would be thrown out of operation by the balancing of a lever between contacts. When between contacts no current was flowing, the by-pass valve was stationary and consequently the main valve was stationary.

Q. 34. And what was the effect of this dash-pot in its action upon the by-pass valve after it had performed its work in conjunction with the re-establishment of proper wheel speed?

A. It was to control the time required in order to move the by-pass valve to the point at which the amount of water diverted to or from the main valve was just sufficient to compensate for the change in load.

Q. 35. And after the speed of the water wheel had been restored, was there any restoration of this by-pass valve to any particular position?

A. It is my recollection that it was necessary to the proper operation of the governor that the by-pass valve should always be in a position to operate in either direction. Consequently, it would have to return to a position about midway between fully opened and fully closed.

Q. 36. And did the dash-pot have anything to do with that?

A. The dash-pot did not bring to it that position as I recall it, but did control the rapidity with which it came to that position for the purpose of preventing its running by.

Q. 37. And did the dash-pot affect the rate of return of the by-pass to its usual position?

A. It could, and I think normally would, although the function of a dash-pot is often merely to absorb sudden shocks.

Q. 38. This dynamo, changes in the potential of the current of which affected the solenoid controlling the other parts of the governing mechanism, you have referred to, being responsive to changes in speed of the

water wheel, were there any changes in such speed due to any cause whatsoever which would not produce governing effects through the change in potential of such electrical energy?

A. The dynamo depended on changes in speed and would not single out the cause for the change in speed.

Q. 39. You have referred to the locking of the main gate after a certain governing action had taken place, what, if you remember, produced such locking of the main gate in the disclosure of Mr. Lyndon to you so discussed?

A. I do not remember the particular device, but when the by-pass mechanism was in equilibrium and the contacts were open, the main gate valve could neither be opened nor closed by its own governing mechanism.

Q. 40. However, if a change in speed took place, would the governing action then work as it had worked on a previous change of speed?

A. With a change in speed the by-pass mechanism first came into operation and this set in operation and controlled the operation of the main gate valve.

Q. 41. And both such operations and controls were responsive to the solenoid pulls or changes in pulls which you have referred to?

A. The control was exercised through the solenoids and they in turn controlled the lever arrangement which in turn determined what contacts should be made and when and for how long.

Q. 42. And in what position was the main gate locked, as you have called it, with respect to the supply of water to the wheel necessary to hold the wheel at the proper speed?

A. The main gate valve would keep moving so long as there was a tendency to change the speed. When the flow through the main gate valve was such as to maintain this speed, the function of the by-pass valve ceases, the lever withdrew the contacts, the mechanism was thrown out and the main gate valve stopped at that point, and would not move again until a further change in speed operating through the by-pass mechanism had again caused the main gate valve to be either opened or closed as the case might be.

Q. 43. And did the bringing of the wheel gate to its proper position resultant upon a change of speed in the water wheel produce, in effect, with respect to any tendency of the governor to overrun or to "hunt"?

A. Overrunning or hunting is caused by alternating excesses and deficiencies in the amount of water passing through the main gate valve. This excess or deficiency is much affected temporarily by the inertia effect of a volume of water suddenly started or suddenly stopped. In other words, with a given amount of water flowing through the head gate, the water wheel may run at a uniform speed. With the same amount of water on the average passing through the head gates there may be speed variations and hunting due to fluctuations in the speed of the water through the connecting pipes resulting in inertia effects. This retardation and acceleration of this current of water may become synchronous, and if it does it is almost impossible to stop it, so that some method of controlling speed variation must be devised which does not depend upon the average water flowing in a given time. The function of this by-pass mechanism was to take care of this inertia effect, or hunting, or



pumping as it is sometimes called, as well as the variations due to changes in load.

Q. 44. And when the water wheel gate of the Lyndon governor as disclosed to you in 1898, had been brought to a position in which you say it was in effect locked, what was that position with respect to the actuation of the water wheel at a proper speed without hunting governor action?

A. The main gate valve would stop at a point at which the amount of water passing through the wheel was sufficient to maintain the wheel at its proper speed at the then load. The by-pass valve could then be gradually moved to its neutral position and at the same time vary the flow through that by-pass valve without disturbing the flow through the main valve, because the movements was so slow that the inertia effects on the flow through the main valve were negligible.

Q. 45. And did all this, or did it not prevent over-running of the governor or hunting?

A. If the mechanism operated properly it would absolutely prevent hunting or over or under-running.

Q. 46. And the parts of this governor operated did they, or did they not, automatically responsive to changes in speed of the water wheel, irrespective of the cause of such changes in speed?

A. The change was automatic and depended upon changes in the speed of the water wheel shaft without reference to the particular cause for such change.

Q. 47. Do you remember what kind of a by-pass valve Mr. Lyndon described to you as to be used in connection with the other features of this governor we are discussing?

A. It was what we called a butterfly valve, which is simply a circular plate with a shaft across its diameter. This type of valve would be used because it is balanced in every position and gives a wide and rapid opening with little movement and can be closed without shock or jar.

Q. 48. Is such butterfly valve always circular in form?

A. Not necessarily; it conforms to the section of the pipe in which it is placed. I simply said circular because I had in mind a circular pipe, but the form should conform to the section of the pipe, and in fact that is not absolutely necessary as the shape may be varied if it is for any reason desirable that there should be a leakage past the valve through its closed position.

Q. 49. And how if such butterfly valve is to become seated on the pipe without the provision of any specific seat other than the pipe inner surface, may or may not the butterfly valve be non-circular or not in conformance with the cross section of the pipe, and whether or not the water is entirely closed off or not when so seated?

A. Ordinarily a butterfly valve is not a tight valve. The degree of tightness depends upon the design and skill with which the valve is made. Ordinarily a butterfly type of valve is not used where more tightness is required.

Q. 50. So that the matter of design of a butterfly valve as to its geometric form may be applied in accordance with the nature of the service in which it is to be used, is that correct?

A. Yes.

Q. 51. In the use of such a butterfly valve is there

any frictional engagement between it and the pipe or its seat at any time when the butterfly valve is not home on its seat or the pipe?

A. Except when seated a butterfly valve is perfectly free, except for the friction in the bearings.

Q. 52. During Mr. Lyndon's description to you of this governor mechanism for water wheels in the summer of 1898, did he, or did he not, make any sketches for you illustrative in part, or in whole, of such governing mechanism?

A. I do not recall any specific sketch but from the very nature of the case we could not have discussed it intelligently unless we had made sketches and it is my recollection that I myself made sketches in discussing the matter with him.

Q. 53. And that he made sketches also?

A. Yes.

Q. 54. Do you know where any such sketches are at the present time?

A. No, I don't.

Q. 55. Do you know whether or not it was Mr. Lyndon's custom to make sketches at that time in discussing with yourself and others mechanical problems or constructions?

Counsel for Defendant: Objected to as immaterial, incompetent and irrelevant.

A. As I have said before, we frequently discussed inventions and illustrated them by sketches.

Q. 56. Are you able at the present time to re-produce any sketch or sketches which were made during Mr. Lyndon's description to you of this water wheel governor?

A. I could not reproduce any sketch then made.

Q. 57. You have had submitted to you, have you or have you not, a copy of U. S. Letters Patent No. 695,220, issued by the United States Patent Office, to Mr. Lyndon for an electro-mechanical water wheel governor?

A. Some time ago Mr. Lyndon sent or gave me the printed patent description issued by the Patent Office.

Q. 58. That is a copy of the patent I mentioned?

A. I suppose so.

Q. 59. And how did the disclosure or description, claims and drawings of that patent compare with the water wheel governor which Mr. Lyndon disclosed to you in the summer of 1898?

A. I don't know that I made any comparative study. The impression it made was that he had obtained a patent on the device which he had talked over with me.

Q. 60. In the summer of 1898?

A. Yes.

Q. 61. I now show you a blue print, concealing the identifying matter at the lower right hand corner, and ask you if there is any similarity or proper comparison between what is outlined therein, or shown thereon, and the water wheel governor which Mr. Lyndon described to you, with sketches in the summer of 1898?

A. This seems to cover it substantially.

Counsel for Complainant: We offer in evidence the blue print just submitted to the witness as Complainant's Exhibit, Blue Print of Complainant's Exhibit Lyndon Reproduction Sketch of his Disclosure Sketch of June and July, 198.

Paper marked "Blue Print of Complainant's Exhibit



Lyndon Reproduction Sketch of his Disclosure Sketch  
June and July, 1898.

Q. 62. Now, you have referred to the general time or period of Mr. Lyndon's disclosure or description to you of this water wheel governor as the summer of 1898, are you able to mention any month of that year prior to which such description and disclosure to you took place?

A. It could not have been later than the early fall. I recall that the bicycle craze was then at its height, and sometimes in the evening Mrs. Merrill and I went down to see Mr. and Mrs. Lyndon on our wheels. I distinctly recollect that the weather was warm, and I would say that it was summer, rather than fall, but I cannot be positive in stating further than if in the fall it was the early fall.

Q. 63. And before what month of the fall as an outside limiting month, if you can so give a month?

A. I do not think I would want to state further than that it was probably not later than the last part of September or early part of October of 1898, and it may have been and very likely was earlier than that.

Q. 64. Was it before there had been any snow fall in New York City, do you remember?

A. No, I can't remember about that.

Q. 65. Your recollection is, as I understand it, that it was warm fall weather, is that correct, and during the bicycling season?

A. My recollection is general. I saw Lyndon as soon as he returned and frequently during the summer, but thereafter much less frequently.

Q. 66. And it was during this more frequent meet-

ing that these disclosures took place as I understand?

A. It was during these more frequent meetings that we discussed this particular invention, because I recollect sitting in his rooms with the windows open and that it was in the warm weather.

Q. 67. As to the inertia effects in the pipe line, was there any object to be obtained<sup>or</sup> with respect to the effect of these inertia conditions upon the pipe line itself in the use of the water wheel governor Mr. Lyndon disclosed to you as you have testified?

A. It would reduce the mechanical strains upon the pipe line, if that is what you have in mind.

Q. 68. And what results from such mechanical strains at times when improper governing took place?

A. Straining of joints and possible rupture.

Counsel may cross-examine.

#### CROSS-EXAMINATION BY MR. WESTALL:

XQ. 69. Are you sure that these conversations that you have had with Mr. Lyndon were not in the year 1899, instead of 1898?

A. I cannot state now further than as the result of what I recall from having looked up the matter previously. At the time Mr. Lyndon spoke of the matter I worked back over certain events and came to the conclusion that that must have been the year.

XQ. 70. But you might possibly be mistaken as to the year, might you not, after so long a period?

Counsel for Complainant: Objected to as not proper method of proof, not calling for a statement of facts.

A. I do not think I could be mistaken because I have

too distinct a recollection of Mr. Lyndon's return and the circumstances attending my early talks with him and his housekeeping arrangements.

XQ. 71. And have you consulted any records or any written memorandum of any kind which would enable you to fix the date as 1898?

A. No, I have not.

XQ. 72. When did you see Mr. Lyndon last?

A. I don't recall the date now, but it was last year, last fall.

XQ. 73. Did Mr. Lyndon inform you about this case and tell you that you would be required to testify?

A. He discussed the invention and said it had been sold and that some question had arisen concerning it which might lead to litigation. He asked me for an affidavit which I gave, but said nothing as I recall it concerning my testifying in a suit.

XQ. 74. Did he recall to your mind any events which enabled you to fix the date of his disclosures to you?

A. He recalled events or they came up in our talks which helped to refresh my memory as to the date and as to the circumstances.

XQ. 75. Did he give you a copy of the patent at that time?

A. I don't recall that he gave me a copy at that time, but I think he had a copy with him.

XQ. 76. Did he show you and explain the workings of the device of that patent at that time?

A. We discussed the matter generally and I gave him my recollection of the events and of our discussions. There was no attempt on Mr. Lyndon's part to

suggest recollections or what might be called to prime me. It was simply a general discussion of events from the time he arrived in this country with the idea of my recollecting as nearly as possible the circumstances and discussions.

XQ. 77. You have stated that your understanding of the device which Mr. Lyndon discussed with you, was that it was a device auxiliary to the usual form of water wheel governor intended to make the operation of the gate valve sensitive, positive and accurate, these conditions not being met with in the existing water wheel governors. Will you please explain a little bit more fully what you meant by that statement?

A. When I say sensitive, I mean a governor which should respond to slight changes in speed; when I say positive, I mean a governor which should cause the valve to move from a given position to the required new position positively and steadily; I mean by the use of the word accurate that when the valve comes to the new position it should stop its movement at approximately its final position.

XQ. 78. What did you mean by the statement that the device was to be auxiliary to the usual form of water wheel governors?

A. Perhaps I should not use the word usual. The governing mechanism was not itself intended to operate the main valve but was to control the mechanism which did operate that main valve, and to a certain extent it displaced the regular governor, but I do not recall that it wholly dispensed with the use of a governor mechanism in addition to the by-pass mechanism.

XQ. 79. It was then intended not as a complete gov-



erning mechanism to do away with the regular form of governor in use at that time, but merely an aid to more close governing, is that correct?

Counsel for Complainant: Objected to as calling for a conclusion and not a statement of fact.

A. It is difficult to say just where this mechanism stopped and what might be called the regular mechanism began. This device was intended to so far control the operation of the main valve and to so far supplement or displace the ordinary water wheel governor as to enable the operation of the wheel to meet certain conditions that the regular governor would not meet because it was not sufficiently sensitive, nor sufficiently positive, nor sufficiently accurate.

XQ. 80. What do you mean when you use the term ordinary or regular governor?

A. Prior to the general use of dynamos the water wheel governor was rather crude; the ordinary mill practice did not require very accurate or sensitive governing. With the advent of the dynamo there was an immediate demand for a better form of governor and numerous devices were invented to attain that result. This was one of the various devices thus brought into being and these devices more or less effected a revolution in what I have called the usual or ordinary type of water wheel governor.

XQ. 81. Please describe the usual and ordinary type of governor which you have mentioned as having been used at or about the time about which you have testified, 1898?

Counsel for Complainant: Objected to as not cross-examination.

A. I am not sufficiently familiar with water power practice to be able to do this, and when I speak of this form of governor it is more in the sense of my general knowledge that the governor then used did not meet conditions imposed by electrical work.

XQ. 82. Can you describe the salient features, or at least the principles of operation, of such regular type of governor as you have mentioned?

A. I would say in a general way that they depended upon centrifugal action and the flowing into governor of a mechanism which would open or close the main valve and that when the main valve had reached a position at which the speed required, then the governor would cause the gears to unmesh and the gate valve would remain stationary at that point. However, I do not wish this to be regarded as an accurate statement as I have never had anything to do except in a casual way with water power work.

XQ. 83. And this electro-mechanical water wheel governor which you say Mr. Lyndon discussed with you in 1898, and the salient features of which you have stated were incorporated in the Lyndon patent in suit, was described to you and intended as you understand to be used in conjunction with and auxiliary to the ordinary type of governor which you have described in your last answer, is that correct?

Counsel for Complainant: Objected to as having already been answered by the witness and as of merely repetitious effect.

A. My interest in the invention was in the control of the inertia forces and in the methods used to bring about that control. This was partly so because in our

steam engine work we had somewhat similar problems in fly wheel inertia effects, which at that time we were spending a great deal of thought over. I do not recall that I discussed with him the exact point at which his invention and the mechanism was connected to the particular governing mechanism of the particular wheel to which it might be applied, and I therefore do not speak with any certainty as to whether the invention in question merely supplemented what I have called the ordinary governing mechanism, by which I mean a wholly mechanical governor, or whether it partly displaced same.

XQ. 84. But you do mean to testify that whether it partly displaced the ordinary type of governor or not, it was a device intended to supplement and render more certain the operation, or at least the effects of such ordinary governor, do you not?

Counsel for Complainant: Objected to as merely repetitious in effect, having already been fully testified to by the witness with great care.

A. I do not mean to say that the invention was intended to supplement or displace any part of existing governing mechanisms except in this way, that there were certain conditions which the usual governing mechanism would not properly or adequately meet, and this invention was designed to so far control, or supplement, or aid that mechanism as the case might be as should be necessary in order to obviate those defects.

XQ. 85. That is to say, that in a case where very close government, or in a place where very accurate governing was required, this device described to you by Mr. Lyndon, was intended to work in conjunction with

the ordinary type of governor in order to take care of those variations which the ordinary type of governor had been found unable to cope with, is that correct?

Counsel for Complainant: Objected to as stating a conclusion, calling for a conclusion, not proper method of proof, and as being merely repetitious in effect and having been already and exhaustively testified about by the witness.

A. I cannot definitely say at just what point in the ordinary mechanism of that period the new mechanism was intended to attach, nor am I prepared to say whether or not the old mechanism need be wholly or partially displaced but it is my recollection that the invention as described did not wholly displace existing methods.

XQ. 86. That is to say, they were to be used in conjunction with the device described by Mr. Lyndon to you, if not physically attached, or connected with that device, at least in the same plant, is that correct?

Counsel for Complainant: Same objections.

A. Mr. Lyndon's device did not go so far as to provide the actual mechanism for operating the valve itself. At least in so far as I recollect my discussion of his invention with him. It was purely, so far as I recollect, a governing mechanism and controlled the mechanical appliance for moving the gate valve.

XQ. 87. Now, at that time in the fall of 1898, Mr. Lyndon's ideas had not been fully crystallized into any definite mechanism, but he was endeavoring to gain ideas and was discussing the theory generally with you previous to putting his ideas on paper, is that not correct?

Counsel for Complainant: Objected to as not call-



ing for a statement of facts, merely stating a conclusion and calling for a conclusion, and as calling for matters outside of the knowledge of the present witness, and not limiting the answer to the knowledge of the present witness, and as manifestly misleading, and an attempt to mislead the witness with respect to a definition of time as stated.

A. I now recollect that Mr. Lyndon's ideas had reached that point where he either had, or said he was about to take the matter up with some Water Wheel Company, I think in the Middle West, with a view to getting them to build a governor and try it out, and I have an indistinct recollect<sup>ion</sup> that he thereafter told me that he had made such an arrangement, or expected to, but in any event he was so far convinced of its practicability that he intended to make a serious effort to have a governor made and tried out in actual practice.

XQ. 88. At the time of these discussions with Mr. Lyndon were you an electrical engineer, or had you completed your electrical technical education?

A. I never had a degree as an engineer; I had at that time, however, been in electrical and mechanical lines for about eight years, and had had in addition to this experience my year of Post Graduate work at Cornell.

XQ. 89. What was it in these descriptions by Mr. Lyndon and these discussions, that impressed you, if anything, as being new or out of the ordinary in devices of that kind?

A. I don't recall that I discussed with him especially the patentability of the device. This whole question

of taking care of inertia problems in electrical works and especially in alternating current work was a very live and important subject at that time. All of the engine builders and certainly many of the water wheel builders were working on the problem, and consequently I took a very deep interest in it as it meant a good deal of money to the Company with which I was located if they could get up a governing mechanism which would meet some of the same conditions that Lyndon was trying to meet.

XQ. 90. I don't believe that you have understood the question. I will ask to have the question repeated. (Question repeated).

Counsel for Complainant: The question having been repeated, we object to it on the ground that it is immaterial incompetent and irrelevant, and that the testimony of the witness speaks for itself as to what was disclosed to the witness, and that the question of novelty is not to be considered at this time with respect to such disclosure, the defense in this case having been closed.

A. I do not know that that particular element impressed me.

XQ. 91. Which elements?

A. Of newness. The thing that I was interested in was that this seemed to be a method of meeting certain difficulties which at that time had not been met with any device that I had heard of, or in any water power plant with which I was familiar.

XQ. 92. Now in the device that was explained to you by Mr. Lyndon, what do you understand should be the operation of the main gate and the by-pass valve when an increase of load was put on the water wheel,

assuming that that increase should be maintained constant for some little space?

A. The increase in the load would decrease the speed of the water wheel below the point at which it should be maintained. In order to increase the speed of the wheel, it is necessary to admit more water through the main valve and for that purpose that valve must be opened. The problem is to open the valve in such a way and to such an extent that the increased amount of water shall effect the speed of the wheel without disturbance from the inertia effect due to a sudden on rush of water due to the fact that momentarily water has been drawn away from the wheel faster than it flowed to it. For that purpose when the main gate valve opens the by-pass valve closes so that water is diverted through the water wheel and supplies the deficiency due to the increase in the load. When that deficiency is supplied then the by-pass valve gradually returns to its normal position, the amount of water flowing through there is so gradually increased that the inertia effect is done away with and the by-pass valve then returns to its normal position, the gate valve to the water wheel has been brought to a larger opening and the additional water required has been supplied without any appreciable disturbance due to conditions other than the change of load.

XQ. 93. Suppose we will say, that a very excessive increase of load is placed on the water wheel and that load continues perhaps practically uniformly for a period of five minutes, now please describe the position of the water gate and the by-pass valve during the five

minutes that the water wheel is carrying this increased load.

Counsel for Complainant: While we do not object to any cross-examination which attempts to establish or discredit the recollection of this witness as to the facts concerning which he has testified, it is manifest that Counsel is attempting to entangle the witness by asking questions only to be asked of an expert, and of one familiar with the art in question generally. The witness has testified that he has not practiced in this art and therefore Counsel is attempting to make an expert of the witness when manifestly he cannot be made an expert of at least in this art. This kind of examination is improper and does not in any way amount to proper cross-examination for the reasons stated, and we inform Counsel that if he insists upon an answer to this question, or any similar answers dealing with specific water wheel governing conditions over and beyond those entering into the discussion of the facts testified to by this witness, he is making the witness his own, and we inform the witness that he need not answer this question, or any other similar questions unless he makes a definite arrangement with Counsel for defendant to testify on his behalf, at such compensation as they may arrive at, unless ordered so to do by the Court.

Counsel for Defendant states that the question is directed to bringing out more fully the details of the alleged invention of Lamar Lyndon and its disclosure to this witness. Counsel for Complainant has gone fully into the theory of inertia effect of the water and has had the witness describe fully the theoretical work-



ing of the device which the witness has described as having been disclosed to him and as being in substantial accordance with "Complainant's Exhibit Lyndon Reproduction Sketch of his Disclosure Sketch of June and July 1898" and the witness has stated that the device disclosed by him was in substantial accordance with the Lyndon patent in suit. The question is strictly cross-examination upon facts which were brought out on the direct, and question is repeated. Counsel is notified that an instruction to the witness not to answer proper cross-examination questions will be made grounds for a motion to suppress the entire deposition if the witness heeds the instruction of Counsel.

Counsel for Complainant: Counsel's remarks are purely argumentative and forbidden under the Rule and furthermore the question speaks for itself. If Counsel wishes to ask the witness whether Mr. Lyndon ever described to him certain conditions involving disturbances of load or speed conditions for five minutes, he may do so, but for him arbitrarily to assume such a condition involving all of the minutae of action of a governor which such hypothesis does involve, is manifestly improper when dealing with questions of fact relating to the disclosure of an invention by an inventor to a recipient. We do not intend to have this record padded with a lot of semi-expert examination, and particularly when there is no expert present. If Counsel wishes to ask questions directed to questioning the recollection of this witness and crossing his direct as to the disclosures of Mr. Lyndon he may proceed to do so, but we again notify the witness that he need not go into questions of expertation, or semi-expertation, and need

not answer the same unless instructed by the Court.

A. That is a technical question that I do not feel qualified to answer as testimony. I have a clear recollection of the general purpose of the invention and of its general features but I am not prepared to state positively how it would work in a particular instance.

XQ. 94. You have described rather fully how the device explained to you by Mr. Lyndon operated, and you have spoken of the relative motions of the by-pass valve and the main water gate, do you mean by your last answer that you do not know, that you are not sufficiently expert, and that you have not a sufficient recollection to know how the main water gate and the by-pass valve operated upon an increase of load?

Counsel for Complainant: Objected to as not proper cross-examination, not calling for a statement of facts and a mere attempt to mislead and confuse the witness and not proper method of proof.

A. I have stated how the mechanism was supposed to operate in order to meet certain conditions in a general way, but it seems to me that is a different thing from going at length into a statement of what would happen under certain circumstances requiring the knowledge of an expert with respect to mechanism not involved directly in the invention in question.

XQ. 95. I understood you to say on your direct examination that when an increased load was placed on a main water wheel that this in the device disclosed to you by Mr. Lyndon required an opening of the main water gate in order to supply water to take up the increase load, is that correct?

A. That is correct.

XQ. 96. Now when the main water gate opened to take up an increased load, if that load continued for some period of time, is it your understanding that the main water gate would stay open and so as to supply the increased water to take care of that load during its continuance?

Counsel for Complainant: Objected to as indefinite and incomplete and not proper cross-examination.

A. There might be conceivable a minute change in load which could be compensated for by an adjustment of the by-pass valve but generally speaking variations in load are taken care of by variations in the flow of water through the wheel, supplied through the main pipe, and not by a diversion of the water from the by-pass so that ordinarily a change in load would be effected by a change in the opening in the main gate valve.

XQ. 97. And during the continuance of that increase of load this main gate would remain open so as to permit the increase of flow of water through it, would it not?

Counsel for Complainant: Objected to as indefinite and incomplete.

A. Yes.

XQ. 98. And still during this increased load, assuming that it is a substantial increase in load and that it continues uniformly, the by-pass valve would coincidentally close or partially close, and so remain, would it not in order to supply the increase of water to be used at the wheel, is that correct?

Counsel for Complainant: Objected to as not proper cross-examination, as indefinite and incomplete and misleading.

A. The by-pass valve closes only long enough to supply to the wheel the deficiency in water until such time as the flow may be re-established in the main pipe in sufficient volume to both supply the increased flow through the main wheel and the waste which is attached as the butterfly valve gradually opens. The butterfly valve does not remain closed during the whole period of the increase in the load, but simply closes for the time required and for the purpose of supplying the momentary deficiency.

XQ. 99. Assuming that a 50% increase of load is placed on the water wheel and that that load continues for five minutes, and that the main water gate has opened sufficiently wide to take care of increase in load do you mean to say that the by-pass valve only opens momentarily, or only closes momentarily and then remains in its normal condition halfway open during the remainder of the five minutes of this increase of load?

Counsel for Complainant: Same objections and observations as made after putting of the previous question involving period of five minutes time.

A. That would determine upon the adjustment of the by-pass valve and dashpot. It might conceivably return in a few moments, or it might be so adjusted as to return to its normal position only after a considerable period, but that does not affect or influence the theory or purpose of the invention, but is merely a question of adjustment.

XQ. 100. If a 50% increase in load is placed on the wheel considerably more water would be needed to maintain the speed constant, would there not?

A. Yes.



XQ. 101. And if the by-pass valve remains in its normal half open position after momentarily closing, there would be no increase in water to supply the wheel, would there, and therefore the device described to you by Mr. Lyndon in 1898 could not under those conditions maintain the speed constant or take care of variations of load?

Counsel for Complainant: Objected to as being a self-answering question and based upon impossible hypothesis, inasmuch as it assumes a change in position of the water wheel gate valve which must in effect produce a difference in flow of the water to the wheel.

A. In the first place it does not follow that the butterfly valve must necessarily entirely close, irrespective of the amount of variation in the load. Whether it does or does not, I do not know, but it does not necessarily follow that it should or will. In the second place, deficiency in speed is a mere relative term, and greater variations are always expected and allowed for and permitted with large variations in load than with small variations in load. In the third place, for the very purpose of absorbing large and sudden fluctuations some form of inertia absorbent is usually provided, and in such cases the effect of this invention would be not to entirely displace such inertia absorption but to decrease the amount necessary to accomplish a given purpose.

XQ. 102. By inertia absorption you mean for instance the old form of air chamber with which pipe lines are frequently equipped, is that correct?

Counsel for Complainant: Objected to as not proper cross-examination.

A. I have not in mind any particular device or mechanism. I simply mean any arrangement which will absorb inertia effects.

XQ. 103. You mean to say that with the device disclosed and described to you by Mr. Lyndon, some form of absorbent is needed?

A. No I don't mean to say that at all.

XQ. 104. Then it is not your understanding or your recollection of the device said to be described to you by Mr. Lyndon in 1898, that such device was capable of taking care of continued increases of loads and maintaining a constant speed?

A. On the contrary, the device would seem to be capable of taking care of repeated increases or decreases of load without limit. So far as constant speed is concerned, that is a relative term. Any speed within the limits of proper operation is called constant speed or uniform speed for that particular machine. Any governing device depending upon variation in speed for its operation can only operate upon a change in speed, so that uniformity of speed must be understood, as it always is in engineering circles, as within pre-determined or prescribed limits.

XQ. 105. I wish you would explain a little more fully what you mean by inertia absorption as used in a preceding answer.

A. It often happens that in a governing device in proportion as it is more sensitive it becomes unstable, and it is therefore often from a mechanical point of view preferable to absorb some of the elements of change in some other mechanism than the governor in order to relieve the governor. Whether it shall or shall not be

done is merely a question of the class of work or expediency as the case may be.

XQ. 106. Will you please describe some of the forms of such inertia absorbents?

A. In the work with which I am most familiar the usual form is a fly wheel.

XQ. 107. And what did you mean by the use of the term inertia absorption as applied to a water wheel governor, or to a pipe line?

A. It might be a fly wheel or it might be a supplementary air chamber, or it might be a combination of both. There may be other devices in water wheel practice with which I am not familiar. It is not a question of device but it is a question of absorbing the inertia effects by some means.

XQ. 108. And your understanding of the device described to you by Mr. Lyndon in 1898 was that it would not wholly dispense with some sort of such an inertia absorbent, or at least it would not render the incorporation into a plant of some such means unwise or unnecessary, is that correct?

A. That does not necessarily follow. It depends upon what you want the governor to do and whether you choose to impose more or less work upon the governor. It is quite practicable in the line of work with which I am familiar to build an engine without any fly wheel whatever but that is not customary practice. But the fact that it is not customary practice does not affect the question of the capacity of a governor to take care of speed fluctuations if it is so desired without the use of the fly wheel.

XQ. 109. You mean to say that it would be possible

under your understanding and recollection to use such a device without some inertia absorbent, but that you believe that the proper practice would be to have some such device connected with the plant, is that correct?

Counsel for Complainant: Objected to as not proper cross-examination.

A. What the proper practice is in water wheel work I do not know. My impression is that there are a great many water power plants in this country which depend solely upon the governor mechanism and with good results.

XQ. 110. In case of severe and continued increases of load, is it your understanding that the inertia form of governor which you said under your understanding was to be used as auxiliary to the device explained to you by Mr. Lyndon, was to be relied upon to take care of, partially at least, such increases of loads?

Counsel for Complainant: Objected to as misleading and improperly quoting the testimony of the witness, and as not proper cross-examination.

A. I don't know whether it was so intended or not. Of course mechanically it is quite possible to throw all the burden practically on the auxiliary governor, or merely to have it take up fluctuations beyond a certain predetermined amount leaving the lesser fluctuations to be taken care of by an auxiliary or other or primary governor, as you may choose to term it. This is wholly a question of design and formation and has nothing to do with the general theory of the by-pass arrangement.

XQ. 111. Is it your understanding that the by-pass of the device explained to you by Mr. Lyndon in



1898, was to be of sufficient cross section to take care of all changes in load?

A. I do not know that that was discussed. It would not be necessary to discuss it because that would be simply a case of design and application. I can see no reason why it should not take care of all the fluctuations if so desired. On the other hand, I can see that for certain classes of work it would make a lighter and cheaper governor desirable if it merely took care of certain fluctuations, and I can also see that it might be desirable to so design it that it would merely be supplementary to existing governors in order to make it easier and cheaper of application. These are practically all mechanical and commercial questions not affecting the theory or operation of the by-pass mechanism itself.

XQ. 112. In case of a long continued increase of load, is it your understanding that the device would so operate as to throw a sufficient amount of water on the wheel continuously during the increase of load to take up that load?

A. Do you mean a load gradually increasing over a period, or a load increased and then staying increased over a period?

XQ. 113. I mean a load increased and maintained constant during a period.

A. The by-pass mechanism simply operates during the time required to bring about stable conditions. As soon as stable conditions are established the by-pass mechanism ceases to operate and returns to its normal condition ready to take care of any other variation when and as it occurs.

XQ. 114. Assuming that the load has increased, say 50%, and is maintained constantly increased for a period of some minutes, is it your understanding that the main gate opens widely enough to throw sufficient water on the main wheel through the main gate to take care of the increase of load, and that the by-pass closes, or partially closes, so as to supply that increase of water which has previously been wasting through the by-pass?

Counsel for Complainant: Objected to as having already been testified to by the witness, and indefinite, incomplete and misleading and not stating any possible working condition, inasmuch as witness has testified that the by-pass returns to its normal or usual position after stable conditions have been produced in the pipe line, and has repeatedly testified that the by-pass action is only for the purpose of initiating such stable conditions, and furthermore that the change in gate position must necessarily produce a change in flow of water to the gate responsive to the increase of load upon the wheel.

Counsel for Defendant: Objected to as being argumentative and as an endeavor to coach the witness, and the question is repeated.

Counsel for Complainant: The witness has so repeatedly testified on this point and the question is so manifestly absurd on its face, that we wish to point out these points imperatively at this point in the record.

A. A mechanism can be adjusted to do a great many things—

XQ. 115. I am not asking how the mechanism might be adjusted, I am asking you whether or not your understanding is as set forth in the question.

Counsel for Complainant: We object to the interruption of the answer. The question is so manifestly absurd that it is apparently impossible of any answer, and the Counsel can with the best grace let the witness do the best he can with it.

A. I do not know that we discussed what might be the capabilities of this mechanism in the way of what might be termed "freak" regulation. It is possible that the mechanism might be so adjusted as to remain in the closed or partly closed condition after the gate valve had been adjusted to deliver the increased flow necessary to meet the increased demand of the load, but such a condition would seem to impair the usefulness of the governor, and I would not suppose that ordinarily it would be so adjusted, but that is a mere academic question.

Counsel for Complainant: The question, in view of all objections and the answer of the witness, is moved to be stricken out as not proper cross-examination and an invasion of the field of academic expertation, and we notify Counsel that we shall instruct the witness not to answer further questions of this sort that are not proper cross-examination, not within the realm of proper fact consideration, unless the witness is ordered so to do by the Court.

XQ. 116. You have stated that when an increase of load was thrown on the water wheel, an increase of water was needed to compensate or take up that load, and in order that more water might be supplied to the wheel the main water gate opened more widely, is it your understanding that the main water gate would remain open during the time during the continuance of this in-

crease of load in the device described to you by Mr. Lyndon in 1898?

A. Irrespective of any governor the gate valve must remain at such degree of opening as will permit the necessary amount of water to pass through with the head which is available.

XQ. 117. And is it your understanding of the construction said to be described to you by Mr. Lyndon in 1898 that when this main gate opened and remained open during the continuance of an increase of load that the by-pass valve closed coincidently in order that the water which had theretofore been wasting through the by-pass might be thrown on the wheel to take up the increase of load?

A. The immediate effect of an increase in load is to increase the demand for water, and if the load is imposed with sufficient suddenness the water will flow through the wheel momentarily faster than it can be supplied through the pipe line. After a certain period, depending entirely upon local conditions, the flow of water in the pipe line will be re-established in such a way as to compensate for that increased load. During this period which will vary with local conditions and with the conditions of load, the by-pass valve so operates as to supply the deficiency, and when that deficiency is supplied the by-pass valve gradually returns to its normal condition and the wastage of water continues.

XQ. 118. So that if a load is thrown on the wheel and that load continues for some minutes, the device described to you by Mr. Lyndon would not operate to close the by-pass so as to throw an increase of water on the wheel during the continuance of that load, but it would



only close momentarily and then it would gradually seek its normal position, is that correct?

A. Generally speaking, yes. It is not a question that can be answered absolutely because the conditions of flow and the conditions of inertia are such that there is a gradual readjustment involving a number of factors, and the most that can be said is this, that the momentary deficiency is supplied by a diversion of the water from the by-pass, and that gradually as the increased flow is established through the pipe, the by-pass <sup>valve</sup> will return to its normal position, and the condition of returning to its normal position is a necessary part of the process of establishing the increased flow through the pipe, and is the condition of absorbing or diverting or destroying the inertia effect which would ordinarily accompany such increased flow through the main pipe if it were not for its diversion through the by-pass opening. Conversely, when the load is decreased the opposite effects take place.

XQ. 119. Now, then, it is your understanding of the device described to you by Mr. Lyndon in 1898, that the increase of water needed at the wheel is not supplied from the water that has been previously wasting through the by-pass by the closing and staying closed of the by-pass valve during the period that the water is needed at the wheel?

Counsel for Complainant: Objected to as having been already, and a great number of times, answered by the witness, who has stated clearly, fully and positively that the by-pass acts to produce stable conditions of flow, whereupon the stable conditions of flow take care of the needs of the wheel, and the by-pass then goes

home to its normal position after its work. This question has been so thoroughly discussed on every side and beyond any notice or present deposition, we object to further cramming the record with such discussion.

A. The purpose of the by-pass valve is to supply a momentary deficiency, or to provide a discharge for a momentary excess, but it has no other function so far as I understand it.

XQ. 120. But suppose this governor is used or attempted to be used, not as an auxiliary or in connection with the ordinary governor, but is depended upon entirely to take care of all variations of load, in other words, to perform all the governing ~~fluctuations~~<sup>variations</sup> of a hydro-electric plant?

A. I know of no mechanical or electrical limitation upon its use for that purpose, if it were so desired.

XQ. 121. Now, if it is depended upon entirely for such purpose, and if an increase of load, say for example 50%, is placed upon the water wheel, and the water wheel gate opens more widely to permit the increased flow, please state where the water to supply this increase will come from?

Counsel for Complainant: Objected to as having been again and again answered, the witness having stated that the gate opening when a further demand is made for water, supplies in its opening such further water, that is what the gate is there for and must be obvious without further discussion and has nothing whatever to do with the proper cross-examination of this witness, and we are going to call a halt right here upon any further examination along this line, and in-

form the witness he need not answer any further questions unless ordered by the Court.

Counsel for Defendant: Counsel objects to the testimony by Counsel for complainant. If the witness would directly answer the questions instead of encumbering the record with statements of assumed other things not within the strict answer of the questions we would be through very shortly.

A. Assuming a sufficient quantity of water to meet all the requirements of load, the governor has nothing to do with supplying water. The amount of water flowing to the wheel is controlled entirely by the main gate opening, and it is merely the main gate opening that is controlled by the governor mechanism. The only thing that the by-pass mechanism does is to divert water temporarily from one direction of flow into another direction of flow.

XQ. 122. And so that your understanding is that the by-pass valve only closes temporarily and then returns to its normal half-open position upon an increase of load no matter how excessive, or how long continued that increase of load will be, is that correct?

Counsel for Complainant: Objected to as assuming facts not testified to by the witness, namely, the normal position of the by-pass.

A. The term momentarily is relative. The by-pass valve will either be in motion or closed until the necessity for the mechanism operating has passed, and the valve will then return to its normal position, but I do not understand that it is intended that the by-pass valve shall be continuously or permanently closed for any condition.

XQ. 123. Your understanding is not then that this by-pass valve will remain closed, or nearly closed, during the continuance of an excessive increase of load continued for some minutes in order that the water which has been wasting through the by-pass, may be thrown on the wheel continuously during the time that it is needed on the wheel?

Counsel for Complainant: Objected to as repetitious and having been testified to fully in at least ten different answers in this cross examination.

A. It is conceivable that the governor might be adjusted to meet that condition if it were made a requirement, but I would consider it an unusual requirement, and as one impairing the usefulness of the governor, nevertheless, I can see no reason why that could not be accomplished with this governor if it were for any reason desirable.

XQ. 124. And your understanding is of the device explained to you by Mr. Lyndon in 1898, that it was not intended to be adjusted to operate as described in my last question, is that correct?

A. I do not recollect that we went so far into details as to discuss every specific condition. It was merely the general purpose and its adaptability to meet certain acknowledged defects and shortcomings in existing water wheel governors.

XQ. 125. What do you understand was to be the normal position of this by-pass valve?

Counsel for Complainant: Objected to as calling for a conclusion with respect to the word normal.

A. Such position as would give the mechanism a rea-



sonable range for either an increasing or decreasing load.

XQ. 126. And what would that position be?

A. I don't know that you can say positively that it would necessarily be in any fixed position for all conditions. In some cases it might have one position if the normal fluctuations were sudden in the way of an increase but slow in the way of a decrease of load, while under other circumstances it might be another position if the ordinary course of events was a gradual increase in a load and a sudden throwing off of a load.

XQ. 127. So that you understand that the normal position of the by-pass valve might be adjusted so as to be completely closed during normal operations, is that correct?

A. I won't attempt to state any particular place at which it should be located for any particular purpose, as I am not sufficiently familiar with the actual construction of the actual requirements. I simply state that as a general proposition the two conditions of sudden increases with slow decreases, and slow increases with sudden decreases exist, and it might be desirable to meet those conditions by a different so-called normal position of the valve.

XQ. 128. So that there might be conditions you say where the normal condition of this valve would be completely closed, is that correct?

A. I would say that theoretically such a condition might be possible, but practically it would be extraordinary.

XQ. 129. Will you please describe a theoretical condition which would make that a proper adjustment?

Counsel for Complainant: We object to going into theory any further in this matter. The witness is testifying in this case of certain facts, particularly about facts which were disclosed to him, and it does not make any difference how far the theoretical conceptions of this witness are illumined by the reception of such facts, and we positively refuse to allow the witness to answer this question, or any similar questions unless instructed by the Court.

Counsel for Defendant again reminds Counsel for Complainant that failure of the witness to answer proper cross questions concerning the operation of the device said to be disclosed to him by Mr. Lyndon in 1898, may be made the ground for a motion to suppress the deposition. This question is clearly proper cross-examination on the disclosures and the descriptions made by the witness on his direct examination.

Counsel for Complainant: Counsel should know that no such motion to suppress can be predicated upon any such instructions to the witness, and if he wishes to compel the witness to answer any question he should resort to the Federal Court within whose district we are taking this deposition by motion to compel such testimony. We are not objecting to any proper questions on cross-examination, although very few of the same have been asked, but we do object to going into questions such as this directed purely to theory and not directed to facts pertinent to the disclosures by Lyndon to the present witness.

Counsel for Defendant: It is submitted that this question is directed to the construction which has been described by the witness as having been disclosed to him

by Mr. Lyndon in 1898; the entire line of direct and cross-examination has been directed to that construction and this question goes to the adjustment and the theory of operation of that device.

Counsel for Complainant: Counsel well knows that we are attempting to take a number of depositions in the East and a further engagement has been made for the taking of deposition of another witness this same day in New Lork, and that the continuation of this cross-examination along improper lines simply means delay for all of us in winding up this session of taking depositions in the East, and we will permit this last question to be answered under the objections made, with the understanding that there shall be no further such theoretical questions and improper cross-examination questions put to the witness. If they are we shall simply bring this deposition to a close and with the final opportunity to the Counsel to ask proper questions of this witness.

A. I would not care to attempt to formulate so difficult a theoretical conception. It would be a very extreme case and at the moment I do not recall any case which would seem to me to justify such an adjustment. Nevertheless, I am not prepared to say but that such a condition might possibly be found or made to exist.

XQ. 130. It is a fact, is it not, that if the normal position of this by-pass valve was adjusted so as to be closed during normal operation that an increase of load could not be taken care of by the governing mechanism, and such governing mechanism would be inoperative under those conditions, is that true?

Counsel for Complainant: We object to this ques-

tion as being quasi technical and an attempt to delve into matters purely beyond the scope of facts disclosed to this present witness, the question not being directed as to what Lyndon disclosed to this witness, but as to possible conditions which might be met with in the application of the invention to the art of water wheel governing with which the witness has stated that he is not familiar, and we instruct the witness that in view of the involved nature of this question, and the objection above named, he need not answer the question unless ordered by the Court, and give this last opportunity to Counsel to ask questions which are proper cross-examination.

Counsel for Defendant: The question is limited as all other questions have been in this case to the disclosure made by Mr. Lyndon to the witness in 1898. Many questions have been asked by Counsel for Plaintiff where these disclosures of 1898 were not specifically mentioned, but they have been understood and the witness is asked to answer the question with that in mind.

Counsel for Complainant: The question goes into certain specific conditions as to which the witness may or may not be informed, and may or may not have been informed by the disclosure of Lyndon to him. The question does not state fully what the construction of the by-pass valve is, and whether there is any stop to limit its movement when closed, is so indefinite and theoretical and at the same time incomplete, and it is absolutely improper within any fair metes or bounds of cross-examination of a witness such as the present with a record such as that in the present case.

Counsel for Defendant objects to the very manifest attempt to coach the witness contained in the objection.



Counsel for Complainant: There is no attempt to coach the witness, because we did not expect the witness to answer this question at all. If the Counsel wishes him to answer it he can get a direction from the Court and the deposition will be closed unless Counsel proceeds to ask questions which are deemed proper in cross-examination.

Counsel for Defendant: It is deemed that the question asked is proper, but in order that there may be no misunderstanding by Counsel or the witness, we will again repeat the question, limiting it specifically to the disclosures alleged to have been made by Mr. Lyndon in 1898.

Counsel for Complainant: The witness has testified to no such disclosure of any such special conditions; if Counsel wishes to ask him as we have suggested before, if Lyndon disclosed any such special conditions to him, he may do so, that is the fair and proper way, but not to assume certain things which Lyndon may have disclosed and then ask the witness whether he knows about them; that is not cross-examination, particularly as it delves into theory with a man who has stated that he is not conversant with the art of water wheel governor as an expert.

XQ. 130. In the device which you have testified was disclosed and described to you by Mr. Lyndon in 1898, I will ask you whether or not there was any means for adjusting the by-pass valve to occupy any other than normal half-open position, or whether you understood from the descriptions that were given you that Mr. Lyndon had in mind means for adjusting the position of the by-pass valve to occupy any position intermediate be-

tween half open or half closed as its position under normal conditions of speed and load?

A. I do not recollect that we discussed specifically details of construction or design or adjustment. We discussed the general theory and the general requirements of the problem. Many of the questions asked have been answered not with respect to what I talked over with Lyndon, but with respect to my personal opinion as to what such a device might or might not be capable of doing. With respect to this particular question of intermediate adjustment I cannot say that that was discussed with Lyndon, but it is perfectly evident from the design that such adjustment might be made.

XQ. 131. You mean the design of the Lyndon patent as it was issued, or do you mean the design of the device disclosed to you by Mr. Lyndon in 1898?

A. I mean the device as discussed with Mr. Lyndon in 1898 was a discussion of principles and general design rather than of specific details of construction. Whether the patent covers such adjustability, or whether the apparatus as built provides for such adjustability, I do not know.

XQ. 132. Having only in mind the disclosures which were made to you by Mr. Lyndon in 1898, and excluding all information that has come to you subsequent to that time, I will ask you to please state whether or not you understood from those disclosures, or would have known by reason of your technical knowledge as an engineer, that such adjusting means of the by-pass valve was possible and could be effected?

A. It is evident from the mere statement of the general features of the design that the device is capable of

adjustment. I would further say that certainly in engine design it is desirable that adjustments should be provided for, which shall take care of variations in the conditions incidental to a particular installation.

XQ. 133. And was it evident, you still testifying as to the disclosures of Mr. Lyndon only, without regard to your subsequent knowledge, that the Lyndon by-pass valve might be adjusted so as to occupy a normally closed position and still perform the purposes of its design?

A. What is a normal position depends upon the conditions which are to be met, and as I have before stated, it is conceivable that there might be conditions imposed which would make a closed condition of the valve a normal one, but such a condition will be unusual and extraordinary and I cannot at the moment outline conditions which would call for such a position being the normal one.

XQ. 134. I am not asking you to outline any special conditions, but merely to state whether or not if such by-pass valve were adjusted so as to occupy a closed position, whether it would perform the functions of its design as understood by you in the disclosures of Mr. Lyndon in 1898?

A. It would perform the functions of its design if the conditions were such as to make necessary only an opening movement of the butterfly valve.

XQ. 135. But if there was an increase of load on a main water wheel gate which normally would require a closing position of this by-pass valve, the normal conditions being adjusted to be closed, the device would not be operative would it?

Counsel for Complainant: Objected to as merely argumentative and theoretical and not complete, not stating facts sufficient to permit an answer to be given and not cross-examination.

A. That question simply asks me this: If the normal condition of the valve is open, can the normal position under the same conditions be closed?

XQ. 136. No, I think you have misunderstood the question. The question is, if the position of the by-pass valve of the device disclosed to you by Mr. Lyndon in 1898, were adjusted so as to be closed during normal speed and normal load, if an increase of load was placed upon the wheel, would the device be operable, and how would it act?

Counsel for Complainant: Same objections.

A. It is not necessary that this device should operate under all conceivable conditions. It might be so attached or so made auxiliary to another governor that the normal fluctuations, or any possible fluctuations under the particular conditions of a particular installation, might be such that there never would be such increase in load as would require the operation of the by-pass mechanism, but only the operation of the by-pass mechanism under conditions due to a decrease in load. Now, while such a condition would be unusual and abnormal and extraordinary, nevertheless if such were the conditions, and if there were a governor which would adequately take care of the increase without requiring any operation in the by-pass mechanism, then the normal position of the butterfly valve could be closed and it would not impair the normal operation of it because



its normal operation would only be to act on a decrease in load.

XQ. 137. In other words, to adjust the device disclosed to you by Mr. Lyndon in 1898 so that the by-pass valve would be closed under normal operation, would be extraordinary and would require some other governing mechanism to supply the deficiency in case of an increase of load, is that not true?

Counsel for Complainant: Objected to as argumentative and stating a conclusion and not proper method of cross-examination.

A. I will not reply unqualifiedly because I have not been in engineering work in some years and conditions change rapidly, and conditions which I would consider abnormal at the time this device was invented might be usual and normal now. All I can say is that so far as my knowledge goes I would expect to find an auxiliary governing device if I found this by-pass mechanism so attached and so adjusted that the normal position was closed.

XQ. 138. Because in case of an increase of load this device would not alone be capable of taking ~~care~~ care of it, is this not true?

Counsel for Complainant: Same objections.

A. I say yes, subject to qualification that I am not given time to study over the problem and am not prepared to say absolutely yes or no with respect to an engineering problem with which I am not wholly familiar.

XQ. 139. Did Mr. Lyndon state to you at any time that the normal position of this valve would be

half way open so that in case of an increase of load it could partially close, and in case of a decrease of load it could be more widely opened?

A. I do not recall that Mr. Lyndon discussed any particular degree of opening which should be considered its normal position. He doubtless did discuss the general proposition that under ordinary conditions there would be some variation on both sides of this normal position before it arrives at the point where it was fully closed or fully opened.

AQ. 149. You stated in your direct testimony that you discussed questions as to whether it would work or not, at that time the matter had not been so fully and completely worked out by you that you felt that the device would be successful, is not that so?

Counsel for Complainant: Objected to as argumentative and as misleading and misquoting testimony of the witness and not proper cross-examination.

A. Lyndon had no question apparently in his own mind as to its successfully meeting conditions. Personally I felt that it would do the work so far as any mechanical requirement was concerned. The particular question in my mind, as I recall it, was whether working a dynamo below the knee of the curve would not result in such sensitive condition as to make the mechanism unstable, but that was a question not of opinion but of working it out and finding if such were the case or not.

## INDIRECT EXAMINATION BY MR. BLAKE-SLEE:

RDQ. 141. If such a by-pass valve were to be normally in closed position where the pipe line was to be protected from inertia stresses incident to sudden closing of the water wheel gate requiring the by-pass valve only to move in an opening direction to prevent such inertia stresses, would that situation come within your comprehension of the possible practical installation upon a pipe line having, we will say, a very high head?

A. I have not considered the question as regards the safety of the pipe line. I have only been thinking of ordinary commercial power installation. Of course I understand perfectly that the inertia problem increases in proportion to the head, but that is a phase of the problem I have not had in mind in making my replies.

RDQ. 142. Now, aside from the use of the water wheel gate itself of any particular type, or any selected type, did Mr. Lyndon in his disclosure to you of this governor in 1898, imply that any other part of old governors was to be retained to be used in connection with the governor he was disclosing to you?

A. I have no distinct recollection as to that point, but I have an impression, to a certain extent at least this might be made auxiliary to existing governors, but I don't recall that the design was such as to make it imperative that some other governor or some other type of governor should be used in con-

junction with this. I think that if we had such discussion it would be more in the nature of discussing this as a commercial possibility and using it in connection with existing governors in order to make it more attractive to purchasers and not as involving a necessity in the theory or design.

RDQ. 143. Did Mr. Lynden state to you that it would require any feature of any other governor construction in conjunction with the governor he disclosed to you in order to make such governor operative?

A. No, not specifically.

Met pursuant to adjournment at the office of Henry C. Meyer, Jr., Architects Building, 101 Park avenue, New York City, New York, at the hour of 4:45 o'clock P. M., May 26, 1915, before M. E. Weardell, Notary Public and Reporter. Present as before.  
~~New York, N. Y., May 26, 1915. P. M.~~

HENRY C. MEYER, JR., a witness produced on behalf of the Complainant in rebuttal, being duly sworn, testified as follows in answer to questions put by Mr. Blakeslee:

Q. 1. Please state your full name, age, residence and occupation?

A. Henry C. Meyer, Jr., 25 Highland avenue, Montclair, New Jersey; age 44; Consulting Mechanical Engineer.

Q. 2. Are you acquainted with Lamar Lynden, a consulting engineer, who has recently had offices at 60 Broadway, this City?



A. I am.

Q. 3. How long have you known Mr. Lyndon?

A. Since 1889.

Q. 4. And under what circumstances did you first meet him?

A. He was a classmate of mine in Stevens Institute of Technology.

Q. 5. How does Mr. Lyndon rank as an engineer in his lines of practice in this City?

Counsel for Defendant: Objected to as immaterial, irrelevant and incompetent.

A. Why as a consulting engineer in electrical work he has a high standing; as to his knowledge of storage battery work he is one of the best engineers in this country.

Q. 6. And has he ever written to your knowledge monographs or articles for publication on mechanical and scientific subjects?

Counsel for Defendant: Objected to on grounds heretofore stated.

A. Yes.

Q. 7. To your knowledge has Mr. Lyndon within the last fifteen years been so financially equipped as to be able to carry on successfully patent litigation of any sort with the attendant expense?

Counsel for Defendant: Objected to for the reason that it has not been shown that the witness is qualified to testify as to the expense of maintaining a patent suit, and he has not been known to have any knowledge of the steps in a patent case, and therefore is not shown to be qualified to pass on the

question whether Mr. Lyndon was financially able to stand such expense.

A. I doubt if he was able to do so.

Q. 8. Have you been in contact with patent litigation as expert or in any other manner during those years?

A. No.

Q. 9. Did Mr. Lyndon at any time ever take up with you the subject of water wheel governors of any kind in general discussion?

Yes.

Q. 10. Do you remember approximately when you had such first discussion with him?

A. Shortly after his return from Japan.

Q. 11. Do you remember when it was he returned from Japan?

A. It is my recollection that it was in 1893.

Q. 12. And at that time where was Mr. Lyndon's office, if you remember?

A. 100 William Street, New York.

Q. 13. And where was your office?

A. 100 William street, New York.

Q. 14. What interest or concern were you connected with at that time, if any?

A. Associate Editor of the Engineering Record.

Q. 15. And do you remember what Mr. Lyndon's business connection was at 100 William street, at that time?

A. Why engineer for the American Trading Company.

Q. 16. Please state what transpired when you

first discussed in 1898 with Mr. Lyndon the subject of a water wheel governor of any kind, briefly referring to the discussion and quoting anything that was said at such discussion as nearly as you can give the language of the discussion.

A. I can't pretend to give the language of the discussion. It is my recollection that I went to lunch with him at the Westchester Restaurant, and he brought up the matter of water wheel governor, which he had designed. He made a sketch of the governor, and the only points that I can recall at this time were the use of a dynamo connected with the water wheel in such a way that the variation in speed of the dynamo was to furnish power for actuating the turbine gate. It is my recollection that I called attention to the fact that the sudden closure of the turbine gate would tend to increase the pressure to such an extent that governing would be difficult, and that Mr. Lyndon suggested the use of a by-pass around the turbine in which a valve was locked; the valve arranged to open as the turbine gate closed and vice versa. He included in the sketch various electrical devices to accomplish the desired object, but as to these I paid little or no attention.

Q. 17. Do you remember any other features attendant upon the by-pass provision and relating to its arrangement or mode of operation or control?

A. No.

Q. 18. Do you remember any of the circumstances involving the production of the sketches that Mr. Lyndon made at this time in 1898 at Westches-

ter Restaurant, as to material used or the procedure in making such sketches?

A. Why it is my belief that he made them on the back of a menu card of the restaurant.

Q. 19. And did you ever see any such sketch afterward?

A. No.

Q. 20. Do you know what became of any such sketch?

A. Imagine he left it on the table.

Q. 21. Was it, or was it not, customary for you to meet Mr. Lyndon during that year and afterward from time to time, and discuss mechanical questions and problems with him, each of you illustrating or partially illustrating the subject matter of your talks by sketches?

A. I met him very frequently, probably several days a week; we lunched together and we were both engineers and we naturally talked more or less about engineering subjects. I can't say that we frequently made use of sketches to explain what either of us were talking about.

Q. 22. Can you state whether it was yours or his practice, or was then, to make sketches in discussing engineering subjects?

Counsel for Defendant: Objected to as entirely immaterial and irrelevant, the question is whether he made sketches at that time.

A. Yes when a sketch simplified the description.

Q. 23. And as to the nature of the sketches made at that time, namely, in 1898, at the Westchester Restaurant by Mr. Lyndon, do you remember wheth-



er they fully disclosed a working construction, or how far did they suggest the same?

Counsel for Defendant: Objected to as calling for a mere conclusion of the witness.

A. It did not go into details of construction. It merely explained the general principles involved. May 27, 1915. A. M.

Q. 24. At the time that Mr. Lyndon described to you in 1898 the water wheel governor, to which you have testified, were you familiar with the water wheel art, Mr. Meyer?

A. Only reasonably so.

Q. 25. Had you come in contact with it in your engineering practice?

A. Yes.

Q. 26. And how did you understand, or in what arrangement or relation, and particularly with respect to the water wheel, were the water wheel gate and by-pass to be arranged and disposed?

A. Only as I have stated before that there was to be a valve in the by-pass arranged to operate in connection with the turbine gate in the reverse way.

Q. 27. And what did the by-pass valve control in its action?

A. It pretended to control the water pressure in the penstock.

Q. 28. And where was the by-pass to be applied with respect to the penstock?

A. In advance of the entrance to the turbine.

Q. 29. And the water so controlled by the by-pass valve was to flow to the by-pass valve from what line?

adj  
head  
one

A. Entrance to the turbine.

Q. 30. So that the water so controlled by the by-pass would pass the wheel instead of striking it?

A. Yes.

Q. 31. Do you remember any particular expression used by Mr. Lyndon at that time with respect to the function of the by-pass and its co-relation with the water wheel gate?

A. No.

Q. 32. Are you able to fix the time in 1898 at which this disclosure took place in the Westchester Restaurant, William Street, New York City?

A. No.

Q. 33. What is the nature of your recollection as to the return of Mr. Lyndon to New York City in 1898?

A. Indefinite.

Q. 34. Do you know where he had been prior to his return to New York?

A. Japan.

Q. 35. Do you know of more than one trip Mr. Lyndon ever took to Japan to your knowledge?

A. It is my recollection he made two.

Q. 36. And how many before this disclosure took place?

A. It is my recollection there were two.

Q. 37. Was Mr. Lyndon with the American Trading Company when he took both, or either of these trips to Japan, do you know?

A. Yes, it is my recollection that he was.

Q. 38. You recollect of his having made any trip to Japan subsequent to his disclosure to you?

A. No; it is my recollection that he went out to Japan for the American Trading Company; I am not sure whether he made two trips or one, but it was after he came back to this country that he made this disclosure.

Q. 39. Had you ever heard of this combination of by-pass and water wheel gate, and the other features which Mr. Lyndon disclosed to you as you have testified in 1898, prior to the time of such disclosure?

Counsel for Defendant: Objected to as going into the prior art, and as immaterial, irrelevant and incompetent.

A. No.

Q. 40. Do you know what became of any sketches that were made at the time of that disclosure to you at the Westchester Restaurant in 1898?

A. No.

Q. 41. Could you reproduce at this time any such sketches, or partially exact sheets?

A. Only in so far as it relates to the by-pass around the turbine. There were a number of electrical connections shown on his drawing to which I paid little or no attention.

Q. 42. Will you make at this time a rough outline of the relation between the by-pass valve and the water wheel gate in conformity with your recollection of that disclosure. I don't want a drawing; if you will take a piece of paper and say this is the by-pass and this the water wheel gate, just the relation as you remember.

A. I can give you a sketch of my recollection of it.

Witness produces rough pencilled sketch.

Q. 43. Will you kindly briefly describe what you have portrayed here by this sketch, and mark the essential features thereof in pencil with terms describing such features?

A. (Witness so marks sketch.) The sketch shows the penstock for delivering water to the turbine, the water being under the control of the turbine gate. A by-pass is provided around the turbine and the by-pass contains a valve which is actuated by the same mechanism that closes or opens the turbine gate and in the reverse manner.

Q. 44. At the time of this disclosure, did Mr. Lyndon specify to your recollection, any particular type of by-pass valve to be used with the water wheel gate in inverse relation?

A. It is my recollection that it was a butterfly valve but of that I am not positive.

Q. 45. And what is the general engineering classification of the butterfly valve?

A. A valve that has approximately the same shape as in the interior of the by-pass and it is supported by trunnions through the axis of the valve in such a manner that the valve is practically balanced.

Q. 46. And during its movement is it at any time in frictional contact with its seat?

A. Not necessarily.

Q. 47. In this respect how does it compare with a plug cock?



Counsel for Defendant: Objected to as immaterial, and also objected to on the ground that the witness has not been duly qualified to testify as an expert.

A. The friction of the plug cock, or any other type of valve than the butterfly valve known to me, would prohibit its use.

Q. 48. You mean its use in conjunction with this device?

A. For this purpose.

Q. 49. Are you acquainted with what is known as needle and nozzle valve?

Counsel for Defendant: Objected to for reasons before stated, and absolutely immaterial, irrelevant and incompetent.

A. Yes.

Q. 50. And is that not a frictionless and balanced wheel in general classification.

Counsel for Defendant: Objected to for the reasons before stated and also because it calls for a conclusion by the witness.

A. If it is balanced there would be more or less friction attendant upon its use.

Q. 51. That friction due to the traverse of the water you refer to?

A. The traverse of the valve.

Q. 52. And with respect to the head of the valve which co-acts with its feet, is there any frictional contact with its surface during valve movement?

A. Not between the valve and valve seat.

Q. 53. Will you kindly indicate roughly any

cross connection with the water wheel gate and the by-pass valve, which you understood to be required to produce the inverse relations between these moving parts in the sketch you have shown. Please mark what you have now added to this sketch as inverse connection between water wheel gate and by-pass valve.

A. Witness so marks sketch.

Counsel for Complainant: Complainant offers in evidence the sketch just produced and finished by the witness as "Complainant's Exhibit Meyer Lyndon Disclosure Sketch," and asks that the same be so marked.

Sketch marked "Complainant's Exhibit Meyer Lyndon Disclosure Sketch."

Q. 54. Subsequent to this session at the Westchester Restaurant in 1898, when Mr. Lyndon disclosed to you the water wheel governor mentioned, did you discuss this matter with him at any other time?

A. No.

Q. 55. You have been engaged in the general consulting and constructing engineer practice ever since the time of that disclosure?

A. No, I was on the staff of the Engineering Record, Editorial Department, until about 1902 when I began the practice of consulting engineer.

Q. 56. In such editorial capacity did or did not matters of hydraulic engineering come within the province of your work?

A. It did.

Q. 57. And since that time have you been from time to time in touch with hydraulic practice in one way or another?

A. Up to the time I left the Engineering Record.

Q. 58. And that was when?

A. About 1902.

Q. 59. And what, if you please, is the general nature of your consulting engineering practice at the present time and since 1902.

A. Mechanical and electrical equipment of buildings, factories and industrial plants.

Q. 60. Will you state, if you so wish, several projects with which you have been so connected in an engineering capacity?

A. The Central Heating and Lighting plant; Distributing systems United States Military Academy of West Point, New York; mechanical electrical equipment of the nine new Chelsea piers of New York City; the mechanical electrical equipment of the Bankers Trust Building, J. P. Morgan Building, in New York; State Education Building at Albany.

Q. 61. Do you remember any further features of the construction and inter-relation of parts and elements entering into the disclosure to you by Mr. Lynden in 1898, that you have testified to, particularly with respect to control of the water wheel gate and control of the by-pass valve in addition to the inverse connections between the same and the water wheel gate?

A. No.

Q. 62. I now show you a blue print, concealing the

identification thereof, and will ask you to state any comparison you have to make as between the same and any sketches Mr. Lyndon made at the time of his disclosure to you in 1898, of the water wheel governor and the subject matter of his description in that connection to you at that time.

Counsel for Defendant: Objected to as leading, suggestive and no proper foundation having been laid.

A. In so far as the use of the by-pass in the valve with an inverse connection to the valve and the turbine gate, the sketch is in accordance with my recollection of Mr. Lyndon's description. The other details I cannot recall.

Counsel for Complainant: Let it be shown that the witness has just considered the photograph of Complainant's Exhibit Lyndon Reproduction Sketch of his Disclosure Sketch of June and July 1898.

Counsel may cross-examine.

#### CROSS-EXAMINATION BY MR. WESTALL:

XQ. 63. How do you fix 1898 as the time of this disclosure by Mr. Lyndon to you in the Westchester Restaurant?

A. I can't fix it definite at this time.

XQ. 64. It might have been 1899, might it not?

A. It might have been.

XQ. 65. Or it might have been 1900?

A. I don't think so.

XQ. 66. Have you read any of the testimony that has been given in this case before you were called as a witness?



A. You mean prior to last evening?

XQ. 67. Yes.

A. I have.

XQ. 68. What testimony have you read?

A. Substantially all of it.

BY MR. BLAKESLEE: We admit that Mr. Meyer was furnished with a copy of the testimony of the witness Lyndon in this case pertinent to the present witness, and any matters involving the present witness as testified to by the witness Lyndon. Aside from that the present witness has not seen any of the testimony in this case of our knowledge.

XQ. 69. Did Mr. Lyndon inform you, or any one else inform you, prior to your being called as a witness, of the issues of the case and what you would be requested to testify to?

A. Yes.

XQ. 70. I mean besides Mr. Blakeslee who has admitted that he <sup>has</sup> furnished you with a copy of the testimony.

A. Mr. Blakeslee called with a letter from Mr. Lyndon stating in effect that he had disposed of the patent and that a suit had been instituted by the holder of the patent and asked if I would be willing to give such testimony as I could give to my recollection of the patent.

XQ. 71. And besides receiving that letter, did you have any other communication with Mr. Lyndon, or any one connected with this suit?

A. None whatever up until last evening; none whatever.

XQ. 72. Have you the letter in your possession

A. Witness produces letter.

XQ. 73. Did you see Mr. Henry, the complainant in this case?

A. I have never seen him nor had any communication with him.

XQ. 74. And this letter that you handed me was presented to you by Mr. Blakeslee?

A. By Mr. Blakeslee.

XQ. 75. Have you seen any of the testimony with regard to balanced valves and in regard to the butterfly valve being properly called a balanced valve in this case?

A. I don't think I have. There has been more or less references to a butterfly valve in the testimony which I have read, but I don't recall having read any such testimony.

XQ. 76. Do you remember the reasons why the butterfly valve was called a balanced valve in the testimony to which you have referred?

Counsel for Complainant: Objected to as being contrary to the testimony of the witness who says he has not read any such testimony.

A. I don't recall any such testimony.

XQ. 77. Please give your reasons for referring to the butterfly valve as a balanced valve?

A. What do you mean by the question?

XQ. 78. You have used the term balanced valve in describing the butterfly valve, I will ask you to state why you refer to it as a balanced valve; in

other words, why the term balanced valve is properly applicable to a butterfly valve?

A. A butterfly valve is generally considered as being a balanced valve and it is desirable to use a balanced valve in a situation of this kind.

XQ. 79. Yes, but why do you refer to it as a balanced valve?

A. I don't know except that it is desirable to use one and the butterfly valve is recognized as being a balanced valve, probably the most perfect balanced valve that is made.

XQ. 80. And you have no knowledge as to why it is called a balanced valve?

A. Balanced in the sense that the only power required to operate the valve is that required to start it in motion and the friction of its bearing, it is ~~un~~affected by the variation in movement or pressure of the fluid it is intended to control.

XQ. 81. You mean that when the fluid flowing through the pipe which is controlled by this butterfly valve comes in contact with the valve, the fluid operates equally on either side of it?

A. Theoretically, yes.

XQ. 82. Why did you refer to a plug cock valve as not being a balanced valve?

A. I don't think I did.

XQ. 83. Would you say that a plug cock valve is a balanced valve also?

A. Yes.

XQ. 84. Now is it your testimony that a plug

cock valve is more difficult to operate than a butterfly valve?

A. Yes.

XQ. 85. And why is that?

A. Greater friction.

XQ. 86. Suppose that the plug is made loose in the valve seat, would that make any difference in your testimony

Counsel for Complainant: Objected to as constituting a negation of the question itself, the question involving a plug cock valve.

A. It would tend to make it easier to operate.

XQ. 87. And if it were made sufficiently loose would it not operate as easily as a butterfly valve? I am assuming that the waste of fluid around it is not of any particular importance and that it may be made extremely loose in its seat.

Counsel for Complainant: Objected to on the ground last mentioned, and also being a question entering into expertation and in dealing with variations of standard structure, and therefore necessarily entering into expertation and hypothetical discussion, and not proper cross-examination, the direct examination having only dealt with standard types and classes of valves, and counsel is cautioned that he is making the witness his own witness and if he persists with such line the witness is likewise informed that he may first look to Counsel for defendant for arrangement as to fees covering any such expert testimony.

Counsel for Defendant calls the attention of the



Court to the numerous repetitions of this objection. Counsel for plaintiff calls in his direct examination for testimony relating to balanced valves; objection is made that it is calling for expert testimony and the witness is not duly qualified, whereupon Counsel carefully qualifies the witness. Upon cross-examination, when it is attempted to cross-examine on the very question, on the very matter that has been brought out in direct examination, Counsel invariably takes refuge in an instruction to the witness that he need not answer the question unless his fees are provided for. Counsel is notified that if he insists upon his instructions to the witness, that his instructions will be made the ground for a suppression of the entire deposition when the matter comes before the Court, as it is not the understanding of Counsel for the defendant that Complainant may draw out such expert testimony as seems agreeable to his side of the case, but bar out anything that seems to be unfavorable.

Counsel for Complainant: Counsel's remarks can, of course, not be considered by the Court at all as they are forbidden by the rules and are purely argumentative, and the costs of taking and returning such portions of ~~the~~<sup>thus</sup> record will be asked to be taxed against the defendant. Apparently Counsel for Defendant is unable to distinguish between questions dealing with fact and questions dealing with expertation. The witness was not interrogated upon an expert basis but only with respect to valves of well known types in connection with his statement of the type of valve disclosed to him in the by-pass by the

witness Lyndon; there is such a marked difference between these lines of investigation that we repeat our objection and statement, and caution Counsel that his entire cross-examination will be moved to be suppressed if he pursues this line of attempted expert examination.

Counsel for Defendant: I suppose that Counsel for plaintiff does not intend his remarks about argumentative objections to be applied to his statements?

Counsel for Complainant: Counsel must know that we are conducting these proceedings for the complainant, taking this deposition for the complainant, and we are simply giving notice upon the record as to what we consider a proper method of conducting the examination. Any futile argument in reply to such statement is, of course, argumentative and forbidden by the rules. We are simply warning and cautioning Counsel for the Defendant, and it is assumed that it is our duty to do so to save the time of this witness and of the Court and expense to the parties.

A. It would be equivalent to butterfly valve if so constructed, if the matter of leakage was of no moment.

XQ. 88. Suppose that each end of this so-called plug cock valve was supported on trunnions, that its main body was cylindrical in shape and it did not come in contact in the casings surrounding the main part of the valve but only at the pivoted points at each of its ends, would you say that that comes within your definition of a balanced valve?

Counsel for Complainant: Same objections and statements, and the further statement is made that obviously this question is purely hypothetical and therefore smacks of the nature of expert examination, the question dealing with the plug cock valve and modification of such plug cock valve so as to be wholly fundamental in its type and necessarily goes beyond any question of fact involved in the examination of this witness.

A. Yes.

XQ. 89. Will you please state a little more fully what the disclosure of Mr. Lyndon was, as you recollect it, and as to the purpose and function of this by-pass valve?

A. To equalize the water pressure at the turbine gates.

XQ. 90. And why was it desirable to equalize this pressure?

A. To prevent the water hammer effect in the moving mass of the water from affecting the regulation in the turbine when the gates were closed.

XQ. 91. Is it your understanding that these two valves, the water gate and the by-pass valve, operated together in any way?

A. Yes.

XQ. 92. Will you please describe how?

A. By means of a mechanism connecting the two so that they worked in an inverse manner.

XQ. 91. So, that when the main water gate opened the by-pass <sup>valve</sup> would close, and vice versa<sup>r</sup>, is that correct?<sup>1</sup>

A. Yes.

XQ. 94. Is it your understanding that a constant waste of water was allowed to flow through the by-pass while the mechanism was operating under normal conditions?

Counsel for Complainant: Objected to as indefinite and incomplete and argumentative.

A. It would depend upon the position of the turbine gate.

XQ. 95. Under the conditions of normal load and speed the turbine gate would be half way open, would it not?

Counsel for Complainant: Same objections and not proper cross-examination.

A. I don't think so.

XQ. 96. If an increase of load was placed on the wheel, how would the main gate operate?

Counsel for Complainant: Same objections.

A. It depends upon the rating of the turbine. If the normal rating of the turbine is its maximum capacity, the gate would be fully open.

XQ. 97. What then would be the position of the by-pass valve?

A. It might be fully closed; it might be only partially so.

XQ. 98. Are you speaking now of things that were explained to you by Mr. Lyndon in 1898 or 1899, or thereabouts?

Counsel for Complainant: Objected to as an apparent attempt to retrench defendant's own position, the cross-examination being based upon the di-



rect examination <sup>as to these matters</sup> if proper cross-examination at all.

Counsel for Defendant: Let me ask Counsel, was his direct examination based upon any other construction than that disclosed to this witness in 1898?

Counsel for Complainant: Counsel has referred to the record of this witness so far.

Counsel for Defendant: And the record clearly shows that the direct examination is based upon the disclosure of Mr. Lyndon in 1898.

Counsel for Complainant: Then it would seem that counsel has answered his own questions; if not, these remarks are objected to as argumentative and forbidden by the rules.

A. I can't recall any conversation as to the exact relative position of the turbine gate and the by-pass valve and my remarks as to their probable position relate to their probable arrangement.

XQ. 99. That is to say, you surmise that that might have been in the mind of Mr. Lyndon without having any definite recollection that he disclosed anything of that kind to you?

Counsel for Complainant: Objected to as argumentative and not proper cross-examination.

A. I have a distinct recollection of the gate and valve being inter-connected in the manner previously described. I have no distinct recollection of the exact relative openings of the two valves under varying conditions.

XQ. 100. Before your examination were you told by Mr. Blakeslee that you might be asked whether or not this by-pass valve could be adjusted so as to be in a position normally closed?

A. No.

XQ. 101. Did any one inform you that such an issue would be raised?

A. No.

XQ. 102. If this by-pass valve disclosed to you by Mr. Lyndon was arranged so as to close under normal conditions of load and speed, and an increase of load was thrown on the water wheel, a 50 per cent increase of load we will say, which continued for several minutes, will you please state how the two valves would operate?

Counsel for Complainant: The remarks previously made of record in connection with this cross-examination in respect to expertation, are repeated and furthermore the question is objected to as being barred by the very testimony of the witness, who has stated his definite recollections, and particularly the question is objected to as not cross-examination.

A. I have no recollection of Mr. Lyndon referring to this matter.

XQ. 103. And you have no recollection of his referring to any adjustment of the valves at all, have you?

Counsel for Complainant: Objected to as indefinite and incomplete.

A. No, except in so far as I have testified.

XQ. 104. So that any testimony you have given as to any capability of adjustment of these valves to occupy any particular position as a normal position, is based merely upon your surmise, or guess, as to

what might possibly result from such construction, is that correct?

Counsel for Complainant: Objected to as argumentative and an attempt to place a specific interpretation upon the testimony of the witness which speaks for itself, and not proper cross-examination.

A. I have no recollection of any discussion of this matter with Mr. Lyndon and my remarks as to relative position of valves relate to the manner in which I would assume they would be designed.

XQ. 105. And would you assume that they might be so designed that the by-pass valve could be normally in a closed position.

Counsel for Complainant: Same objections.

The Witness: Is the witness allowed to make any statement?

Counsel for Complainant: Yes, the witness may make a statement and may define his position clearly and take such position as he chooses with respect to answering any question put by Counsel, he to abide by such decision unless ordered by the Court to answer any specific questions.

Counsel for Defendant states for the benefit of the witness that it is the witness' duty simply to answer the questions, and that if there are any explanations to be made by him to verify his position, that such explanations are to be made on re-direct examination by his Counsel.

Counsel for Complainant: It has been made clear to the witness that questions of expertation, guess and hazard, are not within the province of this in-

vestigation, and he may act accordingly unless instructed otherwise by the Court.

Counsel for the Defendant: If the witness desires to say that he is only guessing as to the probable adjustments that might be made of these two valves without any recollection of the mechanism by which they were connected, then Counsel will not persist in this line of his examination, but if the witness states positively that he knows that such adjustment could be made of that mechanism, then there is no question about the propriety of the cross-examination.

Counsel for Complainant: Objected to as argumentative and forbidden by the rules. The witness has been informed as to his proper position in this matter, he is being interrogated as to question of fact and recollection.

The Witness: I would like to make a statement. The witness declines to answer this question and desires to state that he has no interest whatsoever in the matter one way or another. He was asked by Mr. Blakeslee to give testimony as to his recollection of an event that occurred some years back. He is not retained by plaintiff in any way, and objects to answering any questions of an expert nature, but is perfectly willing to give as fully as possible his recollection of the conversation with Mr. Lyndon.

XQ. 106. It is a fact, is it not, that the mechanism by which this by-pass valve and the main water gate were connected, and were controlled, and their



various adjusting means, were not explained to you at the time of Mr. Lyndon's disclosure to you, is that correct?

Counsel for Complainant: Objected to as argumentative and not proper method of cross-examination and proof.

A. They were explained in considerable detail but I do not recall what they were other than as testified.

XQ. 107. And you do not recollect the relative positions that these two valves were to occupy under varying conditions of speed and load, as explained to you by Mr. Lyndon at that time, do you?

Counsel for Complainant: Same objections and as repetitious.

A. Only as testified.

XQ. 108. Do I understand that you testify that your idea of a mechanism of this kind is that the by-pass valve might be so adjusted as to be normally closed, but that you decline to state what your ideas are with relation to the main water gate when such by-pass valve was in this closed position.

A. Decline to answer.

XQ. 109. Do I understand you to decline to answer what would be the normal position of the main water gate?

Counsel for Complainant: This and the preceding question are brought within former objections as to matters of conjecture and not cross-examination; further the question is objected to as indefinite, incomplete and meaningless and purposeless.

A. I do.

XQ. 110. Assuming that the normal position of the by-pass valve is half way open, what would be the normal position of the main water gate?

Counsel for Complainant: Same objections as not cross-examination and as being manifestly an attempt to force the witness beyond his fully and clearly defined recollections in these matters, and being barred by the definite answer of the witness in these respects.

A. Decline to answer.

XQ. 111. Assuming that a water wheel supplied with a governor such as you have referred to on your direct examination, is operating under normal speed and load, and a sudden increase of load occurs which continues for some period, what would be the operation of these two gates?

Counsel for Complainant: Same objections and observations, and as manifestly hypothetical.

A. I decline to answer.

Counsel for Defendant notifies Counsel for Plaintiff that the refusal of the witness to answer the questions on cross-examination may be made the ground of a motion to suppress this deposition.

Counsel for Complainant: The record speaks for itself and Counsel is left to such procedure as he may think he is entitled to pursue.

XQ. 112. Mr. Meyer, you have stated that you did not believe that Mr. Lyndon since the grant of his patent has been in a financial condition to bear the expense of litigation, have you any very certain

and definite knowledge of the amount of real and personal property and the income of Mr. Lyndon during the period from 1898 up to 1914?

Counsel for Complainant: Objected to as immaterial inasmuch as the patent in suit did not issue until the year 1902.

XQ. 113. I will limit the question to 1902.

A. I have known more or less as to the kind and form of work done by Mr. Lyndon in the period mentioned, and from my knowledge of what engineers are usually paid for such services, I conclude he was not in a position to undertake patent litigation.

XQ. 114. Have you yourself ever been engaged in patent litigation?

Counsel for Complainant: Objected to as having already been answered by the witness on direct examination.

A. No.

XQ. 115. And so that any information that you may possess as to the cost of such litigation is mere hearsay, is it not?

Counsel for Complainant: Objected to as merely argumentative and not cross-examination.

A. It is based upon the general impression that prevails as to the cost of such undertaking.

XQ. 116. You could not say whether Mr. Lyndon had \$500, \$1,000, or \$2,000 in his bank account at any time during the period about which you have testified, could you?

Counsel for Complainant: Objected to as merely

argumentative and immaterial, and not calling for the best evidence.

A. I could not.

REDIRECT EXAMINATION BY MR. BLAKE-SLEE:

RDQ. 117. Are you in a position to state you recollect approximately how soon after Mr. Lyndon's return from Japan these disclosures by him to you of the water wheel governor took place?

A. It is my impression within a few months but as to that I cannot say definitely.

RDQ. 118. You have referred to Mr. Lyndon's disclosures to you of this water wheel governor in 1898, in speaking of the action of the by-pass valve so disclosed to you being designed and provided for the prevention of ram or internal stress in the pipe line or penstock; what, if anything, have you further to say as to any such inertia condition in the pipe line occurring upon opening of the water wheel gate for the purpose of supplying suddenly more water to the wheel?

A. The matter was not discussed at the time the invention was disclosed to me to the best of my knowledge and belief.

RDQ. 119. You have stated that Mr. Lyndon disclosed to you the inverse action of the water wheel gate and by-pass valve that being the case when the water wheel gate opened, what would be the direction of movement of the by-pass valve as disclosed to you by Mr. Lyndon?



A. That it would close.

Counsel for Defendant: Objected to on the ground that the witness has heretofore declined to answer such questions.

Counsel for Complainant: The record speaks for itself. This question deals directly with the disclosure of Mr. Lyndon.

Counsel for Defendant: And so did also all other questions so asked the witness.

Counsel for Complainant: Objected to as argumentative and forbidden by the rules.

RDQ. 120. Several questions have been asked you about plug cock type of valve. Aside from any of those questions involving the modification of such standard type of valve, is such plug cock type of valve truly a balanced valve when the port of the same is considered as changing its axial angular relation with respect to the axis of flow of water to the plug cock?

A. I decline to answer that question, being in the nature of expert testimony.

Question withdrawn.

RDQ. 121. Have you ever seen a plug cock valve of the hypothetical kind referred to by Counsel for defendant, namely, out of frictional engagement with its case and supported on trunnions and bearings still being a plug cock valve?

A. No.

NO RE-CROSS EXAMINATION.

At this time notice of motion is given defendant to suppress the cross-examination of this witness,

and particularly all parts thereof departing from questions based upon or predicated upon the direct examination and relating to any structures hypothetical in nature, or in departure from standard well known type of devices referred to by the witness in his direct and re-direct examination, and all such matters as pertain to expertation and not based in any manner upon the direct or re-direct examination, as being clearly without the purview of this examination, and intended merely to encumber the record and unnecessarily waste the time of this witness, the Court and Counsel.

BY MR. BLAKESLEE: In response to suggestion of Counsel for Defendant that the matter of the witness Hillary C. Messimer not being sworn prior to the commencement of his deposition, be cured by the administering of an oath to him to the effect that he told the truth and the whole truth in his deposition as given, to the end that the deposition be filed as a proper and complete part of the record in this case, without objection as to such failure to swear the witness in advance, Counsel for complainant states that this suggestion of Counsel for defendant is adopted, and that the Notary may so proceed and no question will be raised at any time in this case for these reasons as to the impropriety of the procedure of this deposition, nor will any objection be made at any time to this deposition, or any part thereof, on the ground that the witness was not properly sworn before the commencement of his testimony.

*adjournment & headings omitted.*

Bloomfield, New Jersey, May 27, 1915. P. M.

THORBURN REID, a witness produced on behalf of the complainant in rebuttal, being duly sworn, testifies as follows in answer to questions put by Mr. Blakeslee:

Q. 1. Please state your full name, age, residence and occupation, Mr. Reid.

A. Thorburn Reid; 51; Essex Fells, New Jersey; engineer of the Simms Magneto Company of Bloomfield, New Jersey.

Q. 2. How long have you been connected with that Company, Mr. Reid?

A. Two years.

Q. 3. How long have you been engaged in an engineering capacity in connection with any interest?

A. About twenty-six years.

Q. 4. Did you have any engineering training or course of preparation, academic or otherwise, prior to such practical experience?

A. I was graduate of Stevens Institute of Technology of Hoboken, New Jersey.

Q. 5. Were you ever connected at any time with the concern known as the American Impulse Wheel Company?

A. Yes.

Q. 6. In what capacity?

A. As consulting engineer.

Q. 7. During what years?

A. In the fall of 1897, until some time in 1899.

Q. 8. Can you locate a little more definitely when you severed your connection with that Company in 1899?

A. No it was some time in 1899, I am sure but I cannot locate it any more definite than that.

Q. 9. How did you come to sever your connection with that Company?

A. The Company failed.

Q. 10. Did it ever resume operations?

A. No.

Q. 11. What was its general line of work or output?

A. Of the Company?

Q. 12. Yes.

A. Making and selling water wheels.

Q. 13. Do you remember the names of any other persons connected with that Company at that time in any managerial or leading capacity?

A. H. P. Campbell was President of the Company; J. R. Van Dyke, General Manager, I think his title was.

Q. 14. Did you have any assistant in your engineering department, and if so who?

A. Yes, Richard R. Bryan.

Q. 15. Are any of those gentlemen still alive, and if so whom, and who are deceased, if any?

A. Only J. R. Van Dyke.

Q. 16. Did Mr. Van Dyke have anything to do with the technical side of that business?

A. Not officially, but he was interested in all the engineering technical side of it.

Q. 17, Did you ever hear of a concern known as the American Trading Company of New York City?

A. Yes.

Q. 18. Do you know where that was located?

A. My recollection is that it was at 100 William Street.

Q. 19. And where was the American Impulse Wheel Company at the same time?

A. 120 Liberty street.

Q. 20. And do you know who was the engineer at the time that you were connected with the American Impulse Wheel Company, of the American Trading Company?

A. Yes, that was Lamar Lyndon.

Q. 21. When did you first meet Mr. Lyndon?

A. As I recollect it it was in the summer of 1898.

Q. 22. And do you know where Mr. Lyndon is now, or what his business location is?

Counsel for Defendant: Objected to as immaterial.

A. Well, I haven't seen nor heard from him for a year or more. At that time he was in, I think it was, Pine street, but I am not sure.

Q. 23. What was he doing at that time?

A. My impression is that he was in the consulting engineering practice.

Q. 24. Do you remember the name of any one with whom he was at any time associated in such practice?



A. His brother is the only one I remember.

Q. 25. How did you come to meet Mr. Lamar Lyndon in the summer of 1898?

A. I was taken to his office and introduced to him by either Mr. Van Dyke or Mr. Campbell.

Q. 26. Had Mr. Lyndon been in New York for some time previously to your knowledge?

A. My impression is that he had just returned from Japan.

Q. 27. What transpired when you met him at his office and were so introduced to him, that is, in what connection did you go to that office at that time?

A. I am not sure that I was taken there for the specive purpose of investigating an invention of his, but I am sure that the invention was mentioned at that time.

Q. 28. How soon was this after Mr. Lyndon returned to America from Japan, if you can state positively?

A. Very shortly afterwards, that is my impression.

Q. 29. Can you make it a matter of weeks or months?

A. Certainly not more than a month or two.

Q. 30. What was the nature of this invention of Mr. Lyndon which was taken up at that time?

A. Water wheel governor.

Q. 31. Did you ever discuss it with Mr. Lyndon again?

A. Yes, at my office 120 Liberty street.

Q. 32. How soon after the first meeting of Mr. Lyndon?

A. I couldn't say definitely, but it was while I was consulting engineer of the American Impulse Wheel Company.

Q. 33. And did you discuss this invention with Mr. Lyndon more than one time after the first time?

A. I couldn't say definitely but it is practically certain that I did.

Q. 34. And what did Mr. Lyndon tell you, or disclose to you, in any way at the time of your first meeting with him within a month or two after he returned from Japan in 1898 about this water wheel governor, using Mr. Lyndon's language as nearly as you can, and if that is not possible stating the substance of what Mr. Lyndon said or did in this connection.

A. I would not at this <sup>late</sup> date be able to say definitely how much was disclosed at his office the first time I met him and how much in the later meetings.

Q. 35. How shortly was it after this first meeting with Mr. Lyndon that you had received from him completely such disclosures as he made to you of this water wheel governor?

A. Certainly within five or six months of the time of my first meeting him.

Q. 36. And did Mr. Lyndon ever come to your office to discuss this matter with you?

A. Yes.

Q. 37. Did he on the occasion of your first meet-

ing with him make any sketches illustrative of such water wheel governor invention?

A. As I said I don't remember what was done at the first meeting, but he did make sketches at some of the meetings.

Q. 38. During the meetings of the next five months or so?

A. Yes.

Q. 39. Do you know what became of any of those sketches?

A. No, I have no idea.

Q. 40. Could you reproduce at this time any sketches which were made by Mr. Lyndon at any of the times you have mentioned?

A. No, scarcely.

Q. 41. Now, please tell us what it was Mr. Lyndon disclosed to you about this water wheel invention, using his words, if you can recollect them, and if not, giving the substance of such disclosure, namely, the disclosure or disclosures commencing with the time of your first visit to Mr. Lyndon's office a month or two after he returned from Japan in 1898?

A. As I have said, I can't place the descriptions or the disclosures he made at any particular meeting. He disclosed to me during that period between the time I first met him and five or six months later, a water wheel governor in which a dynamo armature was mechanically connected to the water wheel so that its speed would vary with the speed of the water wheel. The dynamo was so designed as to be specially sensitive to changes in speed of the water

wheel. The changes in the speed of the dynamo produced changes in its voltage, and this change of voltage was utilized to actuate a lever in such a way as to open or close the water wheel gate for the purpose of keeping the speed of the water wheel as nearly constant as possible. There was in addition to this a by-pass valve arranged so as to allow the water in the penstock to pass through it when the gates were closed, so as to avoid excessive speed of the jet against the water wheel under this condition, and to avoid the injurious effects of the excessive pressure that would have been produced by closing the gates if this pressure were not released by allowing the water to pass through this by-pass valve.

Q. 42. What, if any, working relation was there between the water wheel gate and this by-pass valve?

A. I don't recall the mechanical means that were used for producing this relation of the opening of the by-pass valve when the water gates were closed.

Q. 43. What, if anything, was to occur to the by-pass valve when the water wheel gate was open?

A. My recollection is that I thought only of relieving the pressure at the time and I am not sure that any mention was made of the use of this by-pass valve for preventing a possible vacuum in the pipe line when the gates were opened.

Q. 44. Was, or was there not, to be a mechanical connection between the water wheel gate and the by-

pass valve so that the by-pass valve would accompany the water wheel gate in movement?

A. I don't think that any definite means was described for producing this relationship of the valve and the water wheel gate, but merely the general principle of operation that the by-pass valve should open when the water wheel gates were closed. The manner in which this was to be accomplished was not to my recollection mentioned.

Q. 45. Was, or was it not, clear to you at that time that such accomplishment could be effected?

A. It seemed a very simple matter.

Q. 46. Did Mr. Lyndon at any such time disclose to you any particular form or type of by-pass valve which he proposed to use in connection with this governor?

A. My recollection is that it was a butterfly valve.

Q. 47. And what are the general characteristics of a butterfly valve?

A. It is balanced against pressure and has very little friction.

Q. 48. Are those particularly necessary qualities for a by-pass valve to possess, and if so, for what reasons?

Counsel for Defendant: Objected to as calling for matters of opinion clearly, and as not calling for the disclosures made by Mr. Lyndon. A question of that kind clearly makes the witness an expert witness.

Question withdrawn.

Q. 49. Do you remember whether or not any



means were discussed for controlling the action of this butterfly by-pass valve in any respect, and if so, what?

A. No. May be I misunderstood the question.

Mr. Blakeslee: Ask me anything you wish.

(witness continuing) I understood you to mean any means for actuating the by-pass valve so that it would operate in the way I have indicated in connection with the gate valves.

Q. 50. No, my question broadly contemplates any means for in any way affecting the by-pass valve or its connection or controlling it in any manner at any time?

A. I don't recall definitely that any means of controlling the valve was mentioned beyond what I have already stated.

Q. 51. Do you remember whether anything was stated by Mr. Lyndon at any such time with respect to maintaining the valve when not accompanying the water wheel gate in movement, in any particular or usual position?

A. There are certain obvious things that should be done in connection with a device of this character, which I have no doubt were mentioned, but which I could not definitely recall now, as having been mentioned at that time.

Q. 52. Do you remember whether at that time any reference was made to any such device as a dashpot for acting upon the by-pass valve to restore it to any particular position after it had been moved therefrom?

A. My impression is that a dashpot was mentioned in connection with the by-pass valve.

Q. 53. Do you remember any disclosure to you at any such time by Mr. Lyndon pertinent to the governing action so operating upon the water wheel gate as to control its movement in any manner?

A. I don't think I understand exactly what you want, what your question is directed towards, because the whole object of the governor is to work on the water wheel gate.

Q. 54. And do you remember any disclosure by Mr. Lyndon in that connection at any such time relating to the control of the water wheel gate, having in mind prevention of over-movement of the gate?

A. That again I cannot answer definitely, although it is a well known difficulty with governors of that character, and it seems exceedingly probable that it was mentioned, although I have no direct recollection of it.

Q. 55. Now, where was this by-pass valve you have referred to to be located with respect to the water wheel and the gate thereof?

A. In a general way as close to it as it was mechanically feasible.

Q. 56. From what source did the water proceed to the point where it was subject to control by the by-pass valve?

A. From the pipe line.

Q. 57. That is the pipe line supplying the wheel?

A. Supplying the water wheel.

Q. 58. And where was the water directed which was allowed to pass the by-pass valve?

A. I don't think that question arose because it was simply necessary that it should not go through the water wheel.

Q. 59. Did the American Impulse Wheel Company during the period commencing approximately a month after Mr. Lyndon's return from Japan in 1898, take under consideration, to your knowledge, this water wheel governor disclosed to you by Mr. Lyndon as you have testified?

A. It was discussed between myself and the officers of that company.

Q. 60. What was the object of such discussion?

A. It was a question of manufacturing and selling the governor.

Q. 61. Was it ever so manufactured and sold by that Company?

A. No.

Q. 62. Can you assign now any reason?

A. Probably lack of capital.

Q. 63. And what had the failure of this concern to do with such proposition, if anything?

A. The failure was probably a result of the same condition that prevented the manufacture of the governor, namely, lack of capital.

Q. 64. Did the consideration of this governor with the object in view of manufacturing and selling the same by and through the American Impulse Wheel Company, come before you as engineer of that Company during this period of time you have mentioned?

A. The technical consideration of the governor as a mechanical and electrical device was my duty in the matter.

Q. 65. Were any working drawings made of such governor under your instruction, or on behalf of that Company to your knowledge?

A. Not that I recollect.

Q. 66. And do you know whether you made a report in any form to the American Impulse Wheel Company, or its officers, as to your findings with respect to the feasibility of manufacturing and selling this water wheel governor of Mr. Lyndon's?

A. No formal report was made to my recollection.

Q. 67. Was any report made to your recollection of any kind, and if so what?

A. We discussed the matter informally and my recollection is that I considered the device mechanically and commercially feasible.

Q. 68. Was, or was not that the general trend of your statements to the American Impulse Wheel Company in that connection?

A. As I recollect it that was the general trend of my statements to them.

Q. 69. Did you make any such statement or statements to Mr. Lyndon at that time that you recollect?

A. I am pretty sure I did, very sure.

Q. 70. Was there anything about that water wheel governor of Mr. Lyndon's as disclosed to you by him which was nebulous, or incomplete, so that you could not understand the same sufficiently to report upon it to the American Impulse Wheel Company?

A. No, it appeared to me very simple and clear.

Q. 71. Was there anything relating to the disclosure of such water wheel governor by Mr. Lyndon to you and the American Impulse Wheel Company through you, which was incomplete so that it would be impossible to construct a governor of that type without further instructions or descriptions by Mr. Lyndon?

A. No, the principle was perfectly clear.

Q. 72. And would it, or would it not, have amounted to anything more than ordinary drafting room practice and shop practice to have so constructed such a governor embodying the principles and purposes and functions of this Lyndon governor so disclosed to you?

A. It would simply have required a good designer familiar with that class of apparatus to have built a governor in accordance with the description given me by Mr. Lyndon.

Q. 73. Do you remember whether during this period of time which you have testified about in connection with the disclosure to you of Mr. Lyndon's water wheel governor in 1898, you designed any water wheel in connection with your work for the American Impulse Wheel Company?

Counsel for Defendant: Objected to as entirely incompetent, irrelevant and immaterial to any of the issues in this case.

A. At that time I was attempting to govern water wheels of the Pelton type using a number of nozzles.

Q. 74. Did you show such a governing device to Mr. Lyndon at that time?

Counsel for Defendant: Same objection.



A. I do not recollect definitely that I did.

Q. 75. And how many wheels were used in that governing device?

A. My recollection is there were six.

Q. 76. And how was the governing effected, briefly stated.

Counsel for Defendant: Same objection.

A. I governed one nozzle at a time.

Q. 77. And that changed the speed of the wheel, was that the result?

A. That was intended to keep the speed of the wheel constant as nearly as possible.

Q. 78. By changing the volume of water applied to it?

A. By changing the volume of water in one nozzle at a time.

Q. 79. I show you a blueprint, concealing the identifying matter therefrom, and ask you if you know anything about it?

A. This print has a more or less familiar aspect and recalls to my mind the sketches and description of his device given me by Mr. Lyndon.

Q. 80. At the time in 1898 you have mentioned, do you mean?

A. In 1898, yes.

Q. 81. Can you point out in that sketch any particular features which correspond with features in such sketches so made for you by Mr. Lyndon in 1898?

A. The familiar features of it are the dynamo armature with the solenoid, whose coil receives current from the armature, the lever actuated by the core of the sol-

enoid in such a way as to actuate the water wheel gate. The actual mechanical and electrical means by which this lever actuated the gate, I do not recall as having been incorporated in the sketches Mr. Lyndon made in describing his invention to me in 1898, although I seem to recall the clutch mechanism shown in this sketch that you have just handed me. (Witness puts his finger upon the gear clutch mechanism on the part marked "gate shaft.")

Q. 82. Do any of the other features of this blueprint correspond with the features of such sketches made by Mr. Lyndon for you in 1898?

A. I do not recall any more of the features as having been in his sketches.

Counsel for Complainant: Let it be shown that the witness has just been considering Blue Print of Complainant's Exhibit Lyndon Reproduction Sketch of his Disclosure Sketches in June and July 1898.

Counsel may cross-examine.

### CROSS EXAMINATION.

BY MR. WESTALL:

XQ. 83. Before testifying in this case you were allowed to look over some of the testimony given by Mr. Lyndon and others, were you not, by Counsel for plaintiff?

By MR. BLAKESLEE: We admit that a copy of the testimony given by Mr. Lyndon in this case and referring to the present witness, has been before the witness to refresh his recollection prior to his testifying, but that was all of the testimony in this case, with the exception of fragmentary testimony necessarily interwoven with it.

XQ. 84. Have you any independent recollection, and will you say that if you had not seen the dates given by Mr. Lyndon of these alleged disclosures, that you could testify positively that these disclosures were made some time in 1898?

A. Yes.

XQ. 85. You are positive then in stating that these disclosures were made some time during 1898?

A. Yes.

XQ. 86. You have stated that it was your impression that it was just after the return of Mr. Lyndon from Japan. Have you any definite knowledge on that subject?

Counsel for Defendant: Objected to as having been already testified to by the witness, who has so stated.

A. A definite knowledge that it was just after his return from Japan?

XQ. 87. Yes.

A. My statement was that I was under the impression when these disclosures were made to me that Mr. Lyndon had just returned from Japan. I have no definite knowledge of his having been there or having returned from there, except that was the impression I had; where I got it from I don't know.

XQ. 88. Can you state positively that it was during the fall or winter of 1898 that these alleged disclosures were made to you?

A. Part of the disclosures were undoubtedly made before the winter of 1898. I could not be certain that all of them were.

XQ. 89. Is it your recollection of the device so dis-

closed to you by Mr. Lyndon, that there was to be a constant waste of water through the by-pass during normal conditions of speed and load of the water wheel?

A. I do not recollect that that was to be the case.

XQ. 90. Do you recollect that that was not to be the case?

A. No.

XQ. 91. Now Counsel <sup>on</sup> ~~is~~ exhibiting to you the Blue Print of Complainant's Exhibit Lyndon Reproduction Sketch of his Disclosure Sketch of June and July 1898, covered the identifying marks of this sketch. It is a fact, is it not, that that sketch with its identifying marks was exhibited to you just before giving your testimony and it was explained to you what the sketch was intended to represent, was it not?

A. Not that I recall. You ask two questions. The sketch was shown to me with identifying marks; I did not look at the identifying marks, or even notice that they were there, and it was not stated when it was shown to me what it was.

XQ. 92. What was explained to you in relation to this sketch at the time it was shown to you just before testifying?

A. It was handed to me and I immediately said that it looked familiar and explained that it reminded me of sketches made by Mr. Lyndon in describing his governor to me in 1898.

XQ. 93. When you refer to the butterfly valve as balanced against pressure, what do you mean?

A. That it can open or close with great facility with pressure on one side only of the valve, while the ordin-

ary valve must move against pressure generally in closing.

XQ. 94. By ordinary valve to what do you refer?

A. Well a relief valve with a spring behind it is a good example of what I mean by an ordinary valve.

### REDIRECT EXAMINATION.

BY MR. BLAKESLEE:

RDQ. 95. You speak of your impression or recollection of Mr. Lyndon's return from Japan being a month or so prior to his first disclosure to you in connection with this water wheel governor invention, are we to understand that that is merely your impression at this present moment, or has been your impression since the time of these early disclosures by Mr. Lyndon?

A. It was my impression at that time and since.

RDQ. 96. How soon was it after the first disclosure by Mr. Lyndon to you in this connection in 1898, that you commenced to consider this matter and the feasibility of this governor on behalf of the American Impulse Wheel Company, approximately?

A. I can only place it within the five or six months we were considering the matter.

RDQ. 97. I mean how soon you first commenced to consider it?

A. That is what I mean. I don't know how soon.

RDQ. 98. Am I to understand you were considering it during those five or six months?

A. Yes.

*adjournment omitted.*

STATE OF NEW JERSEY, County of Essex. ss:

FREDERICK T. CRAMER, being duly sworn, de-



poses and says that he is a Notary Public in and for the County of Essex, State of New Jersey, duly authorized to administer oaths and that he is a citizen of the United States and a resident of County of Essex, State of New Jersey; that the foregoing deposition of Thorburn Reid was taken before him on May 27, 1915, at his office in the Watsessing Bank, Bloomfield, New Jersey, commencing at the hour of three o'clock P. M.; that there were present Raymond Ives Blakeslee, Esq., Solicitor and Counsel for Complainant, and Joseph F. Westall, Esq., Solicitor and of Counsel for Defendant; that the said witness was duly sworn by me before commencing his said deposition, to tell the truth and nothing but the truth; that the said deposition of said witness and the proceedings had in connection therewith were written out stenographically by M. E. Woardell in his presence or under his direction, and were reduced to typewritten form under his direction; and that said deposition and record in connection therewith is a full and complete record of said deposition as taken and the proceedings had and taken in connection therewith; that he is not connected with either of the parties to said suit in which said deposition was taken in any manner as attorney, or otherwise, or is not directly or indirectly interested in the event thereof, nor is he related to either of said parties by marriage or otherwise.

That he is returning said deposition to M. E. Woardell, the Notary, to be filed by her with the Special Examiner in this case.

Notarial Seal.

FREDERICK T. CRAMER.

County Clk's. Certificate.

Sworn to and subscribed before me this 11th day of June, 1915.

ALFRED H. EDGERLEY.

*Notary's certificate omitted*. Notary Public.

Met pursuant to adjournment at the office of M. E. Woardell, Notary Public and Reporter, Room 805, 31 Nassau Street, New York City, New York, at 9:30 o'clock A. M. May 28, 1915. Present Raymond Ives Blakeslee, Esq., Counsel for Complainant. Counsel for defendant not having put in an appearance and it being now some minutes past the time of meeting, an adjournment is taken until the hour of 10:15 o'clock A. M., same day, at the same place.

Met pursuant to adjournment at the same place, at the hour of 10:15 o'clock A. M., May 28, 1915.

Present Raymond Ives Blakeslee, Esq., Counsel for Complainant; Joseph F. Westall, Esq., of Counsel for Defendant.

At this time and place it is stipulated by and between the parties to this case, duly represented by their Solicitors and Counsel, that the deposition of Harry E. Knight, of the office or firm of Knight Brothers, attorneys at law and practitioners in patent matters, of 2 Rector Street, New York City, New York, may be taken at the hour of 10 o'clock A. M., Saturday May 29, 1915, before M. E. Woardell Notary Public and Reporter, or at such time and place within the next ten days as may be convenient to all persons concerned, and as may in be discretion of the Notary be set, pursuant to stipulations

and agreements between the parties by ~~the parties by~~ their Solicitors and Counsel, and pursuant to the general order of the Court extant in this case, at the office of said Knight Brothers, at said 2 Rector Street, New York City, New York, upon the following questions now and hereby settled as between the parties to be propounded to said Harry E. Knight by said Notary Public, who is duly authorized to receive such deposition in answer form to such questions, and to receive in evidence and mark as Complainant's Exhibit Knight Brothers Lyndon Records, in one group, all papers, documents, records and the like which may be produced by such witnesses, Harry E. Knight, in connection with this taking of said deposition, Raymond Ives Blakeslee, Esq., Solicitor and Counsel for Complainant, and Joseph F. Westall, Esq., Solicitor and of Counsel for defendant to be noted as constructively present, irrespective of their actual presence at that time and place; and that said Notary shall duly certify the deposition so taken and any such Exhibit so received and mark and return the same to I. Benjamin, Esq. Special Examiner in this case, International Bank Building, Los Angeles, California, as regularly taken, received and offered and certified, although said Solicitors and Counsel may not in person be present at the taking of such deposition.

AND IT IS FURTHER STIPULATED by and between said parties, and by their said Solicitors and Counsel that no objection will ever at any time be raised by either of the parties hereto to such procedure in and upon the taking of such deposition of said Harry E. Knight, and the offering and receiving and marking and

certifying of any such Exhibit in evidence, and the certifying and returning of said deposition.

This stipulation is rendered necessary in order that the Solicitors and Counsel of the parties to this suit may expedite the business of collecting proofs under stipulation east of the Mississippi River requiring considerable travel from point to point and in order that both said Solicitors, who are taking these proofs, may be enabled to return to Los Angeles, California, as required in the early part of June 1915, because of Court engagements at that place.

*interrogations & cross interrogations omitted.*

Met pursuant to adjournment at the hour of 1:30 P. M., May 28, 1915, at the office of M. E. Woardell, Notary Public and Reporter, Room 805, 31 Nassau street, New York City, New York, present as before.

EDWARD LYNDON, a witness produced on behalf of Complainant in rebuttal, being duly sworn, testified as follows in answer to questions put by Mr. Blakeslee:

Q. 1. Please state your full name, age, residence and occupation?

A. Edward Lyndon; 35 years old; St. Pauls Hotel, New York; electrical engineer.

Q. 2. How long have you been practicing as an electrical engineer?

A. Since 1899.

Q. 3. What academic or technical training did you have in preparation for such practice?

A. Four years at the University of Georgia.

Q. 4. Do you remember what year you graduated in from that University?

A. In 1899.

Q. 5. Where was your home previous to graduating from such University?

A. Athens, Georgia.

Q. 6. For how many years had you resided there?

A. All my life.

Q. 7. Are you acquainted with Lamar Lyndon, a consulting engineer of New York City, New York?

A. Yes, sir.

Q. 8. How did you come to be acquainted with him?

A. We happen to be brothers.

Q. 9. Can you state one or more connections or fields of work you have had as electrical engineer since graduating from the University of Georgia?

A. I have been associated with Companies in designing and building electrical apparatus, and have been building Street Railways and general consulting work here in New York City.

Q. 10. Can you mention the names of one or more of such concerns?

A. Electric Storage Battery Company, Philadelphia, Pennsylvania; Gould Storage Battery Company of New York; General Storage Battery Company of New Jersey; was associated with Dr. Louis Duncan for three years in general consulting work.

Q. 11. With what concern are you connected at the present time?

A. Bijur Motor Lighting Company.

Q. 12. Do you know whether your brother ever did any work in connection with development of the water wheel governing art?



A. Yes through things he told me from time to time, he was working on this subject.

Q. 13. Do you know whether he ever received any patent for such a device?

A. Yes he did receive a patent.

Q. 14. When did he first speak to you about water wheel governors, and his work in connection therewith?

A. On his return from Japan in 1898.

Q. 15. Do you know what he went to Japan for, or for whom?

A. He went for the American Trading Company.

Q. 16. Where were they located at that time?

A. Main office was in New York City.

Q. 17. And when he came back from Japan did he have any further connection with that Company?

A. Yes; he was made Chief Engineer.

Q. 18. And how do you fix the time of your brother's return from Japan in 1898?

A. It was the last summer I spent at my home.

Q. 19. You had spent all the previous summers there?

A. I had.

Q. 20. Where were you the following summer of 1899?

A. In New York.

Q. 21. And what connection is there between your spending your last summer at Athens, Georgia, and your brother's return from Japan, or what enables you to associate these two facts.

A. That fact that my brother had been away for a number of years and on his return to this country he

came to visit his home, and I recollect that as being the last summer I spent at my home.

Q. 22. How soon after his return from Japan in 1898 did your brother Lamar Lyndon come to his home at Athens, Georgia?

A. I think it was before the middle of June as I was still in College at the time.

Q. 23. And how long after his actual return to New York City, if you can state it approximately?

A. I can't state that approximately.

Q. 24. And you stated it was before the middle of June that he returned to Athens, Georgia, to his home?

A. I was still in College and College season closes the middle of June.

Q. 25. And how early in that year did you hear that your brother had returned from Japan, as nearly as you can remember?

A. Well I knew of his coming back many months before he returned, just when he came I do not remember.

Q. 26. Can you state with certainty the year he returned from Japan?

A. I can; in 1898.

Q. 27. How soon after your brother's arrival in Athens, Georgia, in 1898 did you first see him.

A. Immediately.

Q. 28. Approximately how long was your brother in Athens, Georgia, on the occasion of that visit?

A. Well, I am not certain as to the length of his stay.

Q. 29. Can you state what year he left Athens after the occasion of this visit?

A. 1898 he left Athens.

Q. 30. And where did he go from Athens?

A. New York City.

Q. 31. And do you know what he did on his return to New York City at that time?

A. Became Chief Engineer of the American Trading Company.

Q. 32. And was, or was he not in New York, or making his headquarters in New York the rest of 1898?

A. Yes, his headquarters were in New York in 1898 and 1899.

Q. 33. And when was it your brother first spoke to you about this water wheel governor device?

A. Within a short time after his arrival in Athens, Georgia, in 1898.

Q. 34. That is as near as you could fix it, that would be a short time after June 15, 1898?

A. I fix that time by the fact that I was in College up until the middle of June, and before I left College he had spoken to me of this water wheel governor.

Q. 35. Can you recollect, and if so, please state what it was your brother said to you in Athens, Georgia, in the summer of 1898, as you have testified in disclosing to you this water wheel governor device which you have told us about. If you can remember his exact language, or any part thereof, please repeat the same, and if you cannot, please state the substance of what he so disclosed to you?

A. I can repeat only in substance what was said in regard to governors. Just previously to that time I had been engaged on just college survey work on the water power and he explained the operation of the governor

he had devised, the action being to prevent the gates from over-running and for fixing the gates at a definite point, and this was done by a generator which was driven from some shaft, and the voltage of the generator being sensitive to speed changes the general method of control was by means of the butterfly valve in a by-pass.

Q. 36. Returning again to your testimony as to the events relating to your college course in Athens, Georgia, are we to understand that you commenced your summer vacation from that College on or about the 15th of June, 1898?

A. Yes.

Q. 37. And how long a period of time did that vacation consume, approximately?

A. Three months.

Q. 38. Can you recollect how much of that time your brother remained at Athens, Georgia.

A. My recollection is a short part of the three months.

Q. 39. Was he at Athens, Georgia, again that year?

A. I am not positive.

Q. 40. Do you recall that he was?

A. I cannot fix definitely any time he was there after that.

Q. 41. You do not recollect any time he was there after that time?

A. The only time I can fix definitely is during the beginning of the summer of 1898 when he first came back from Japan.

Q. 42. And it was on that occasion that you say he laid before you this water wheel governor?

A. It was positively at that time while I was still in College.

Q. 43. That is before the vacation had commenced?

A. Before the vacation had commenced.

Q. 44. And in the year 1899 where did you spend the summer?

A. New York.

Q. 45. With whom?

A. With my brother.

Q. 46. Were either of you in Athens, Georgia, that summer, if you recollect?

A. The summer of 1899?

Q. 47. Yes.

A. Neither one of us was in Athens during that summer.

Q. 48. You have mentioned a shaft by which the dynamo was to be operated in your statement of what your brother disclosed to you in the summer of 1898 about water wheel governor; by what was that shaft to be driven?

A. Driven from the water wheel; some shaft that bore a fixed speed relation to the speed of the water wheel.

Q. 49. You have likewise referred to a by-pass: What were the arrangement and working relations of that by-pass with respect to any other parts of the governor?

A. The function of the by-pass as explained to me was to relieve the pressure set up in the pipe line by opening the butterfly valve in the by-pass when the gates were suddenly closed and the reverse operation when the gates were opened.



Q. 50. Where was the by-pass to be located with respect to the water wheel gates?

A. The by-pass was to be connected ahead of the turbine.

Q. 51. Connected with what?

A. To the incoming pipe line.

Q. 52. And what would be the disposition of any water passed through the by-pass?

A. Lost.

Q. 53. Would it pass to the wheel?

A. No water through the by-pass passed to the wheel.

Q. 54. And was there to be any provision of any other part or element in any way affecting the action of the by-pass?

A. I don't believe I quite get that. Will you please repeat the question. I don't understand that. Will you cast that question differently?

Q. 55. I will restate the question. Was any other part or feature to be provided as disclosed to you by your brother at that time, in any way acting upon the by-pass?

A. I don't recall any now.

Q. 56. Was the by-pass valve to be maintained usually in any selected position?

A. The relative location of the butterfly valve depended on the gate opening.

Q. 57. So that what would be the relation, or working relation, or operative relation, or nature of coupling as between the water wheel gates and the by-pass valve?

A. There would be an inverse coupling between gates and valve.

Q. 58. And was any other part or element to be provided which in any way controlled the by-pass valve in the by-pass?

A. I don't recall it.

Q. 59. Do you recollect anything which was disclosed to you by your brother at this time relative to maintaining the by-pass valve in any particular position after it had accompanied the water wheel gates inversely in movement?

A. Only through questions of mine as to probable loss of water through the by-pass in which the valve might be partially opened at all times. I do recall his making some statement as to how this was to be provided for.

Q. 60. Do you remember his suggestion to you of anything for bringing the by-pass valve to such a selected position after it had operated in conjunction with the water wheel gates?

A. I only remember that he answered my objection to my satisfaction at that time; just how or what means were to be taken, I don't recall.

Q. 61. You remember his making any reference in connection with this governor to any dashpot device that was to be provided?

A. There was a dashpot.

Q. 62. Where was that to be provided?

A. On the valve.

Q. 63. Which valve?

A. Butterfly valve.

Q. 64. And what was that provided for?

A. To bring the valve back to a fixed position.

Q. 65. That is the butterfly by-pass valve?

A. Butterfly by-pass valve to a fixed position.

Q. 66. After what?

A. After the valve had been moved.

Q. 67. Which valve?

A. Butterfly valve.

Q. 68. Of the by-pass?

A. Of the by-pass.

Q. 69. What briefly is a butterfly valve?

A. A butterfly valve is a valve fixed in a rotating position in a pipe line.

Q. 70. What is its general classification among valves?

A. I don't know its classification.

Q. 71. How is it mounted with respect to its seat?

A. There is a pin through the center of the valve and the valve rotates in the center of the pipe or by-pass.

Q. 72. And what is its relation to the pressures of fluid brought to bear upon it, or how does it receive pressures? I am asking so that the record may show clearly what the butterfly valve is according to your testimony.

A. On the face of the valve.

Q. 73. And aside from any external or additional actuation, what is the effect upon the valve of the pressure of the fluid which flows to it, that is do the pressures of fluid tend to move it of themselves?

Counsel for Defendant: Objected to as leading.

A. No.

Q. 74. And what is the relation between the butterfly valve and its seat during the movement of such valve?

A. The seat remains fixed and the valve moves.

Q. 75. And is there, or is there not any friction of the valve upon its seat during the movement of the valve?

A. There is no friction of the valve on its seat.

Q. 76. Now, with respect to what you have called part of this governor disclosed to you by your brother in 1898, which you have referred to as preventing the overrunning of the governor or of the gates, what was the nature of that feature?

A. That the gates in opening should not over-travel and there would not be a see-saw action when opening and closing.

Q. 77. When the gate started to move as controlled by this governor, how far would it move in response to a change of speed in the water wheel?

A. It traveled to some definite position.

Q. 78. And did it remain there?

A. It remained in that position.

Q. 79. And what would be the advantage of this?

A. The gate would give a uniform flow and prevent a hunting of the gates in attempting to find the right opening for the imposed load.

Q. 80. Do you remember any further the particular nature of these features, aiming at preventing hunting or over-running of the governor, or a see-saw action of the water wheel gates?

A. No, I don't recall just what was the provision made.

Q. 81. In general, how were these various parts to be actuated or operated, that is these various features

and elements of the governor of your brother, which you have told us about?

A. The generator which was to be driven from the shaft of the water wheel, or from some shaft having a fixed speed relation to the water wheel shaft, was to be a machine which operated at very low magnetic saturation so that it would be sensitive to any speed changes.

Q. 82. Did your brother specify to you at any time when he disclosed this water wheel governor to you, what the windings of the field of this generator were to be in kind?

A. I remember that to be a plain shop wound machine.

Q. 83. Do you remember any further how the various other parts and features, namely, the working parts and features of the governor, were to be actuated?

A. I can't recall the details other than the fact that current from the generator actuates a solenoid and that the movement of this solenoid brought about the operations to effect the gate openings.

Q. 84. Did you keep in touch with any further work of your brother such as there may have been in and about this water wheel governor subsequent to his stay in Athens in 1898?

A. I did up to the time the patent was granted.

Q. 85. Do you recollect any other particular step in that connection taken by your brother?

A. No other than the working out of the actual design or the various parts.

Q. 86. Did you remain in Athens until the summer of 1899?



A. I did.

Q. 87. And did your brother put before you any of these various steps in developing this governor?

A. He did.

Q. 88. Did you see a patent which was issued for this governor?

A. I did.

Q. 89. And how did the disclosure of that patent compare with what your brother had disclosed to you in the summer of 1898?

A. I don't recall any differences that were enough to excite my curiosity.

Q. 90. Do you remember any differences in principle or function of the general elements?

A. No difference in function.

Q. 91. And in general principle?

A. Or in general principle.

Q. 92. Were or were not your brother's disclosures to you in the summer of 1898 of this water wheel governor sufficient to enable you then to have made drawings of the same from which such a water wheel governor could have been constructed?

A. They were and it is my recollection I did make a set of drawings.

Q. 93. During that summer?

A. During that summer.

Q. 94. Do you know where those drawings are now?

A. I don't know whether they are in existence or not.

Q. 95. Where would they be if in existence?

A. They would be in the University of Georgia.

Q. 96. If they were made at that time, would they have been made during vacation, or after your return to College.

A. They would have been made during vacation.

Q. 97. Would it be possible for you to ascertain whether such drawings are in existence now?

A. It would be possible I suppose to find if these drawings are still kept. They would be kept as records if that work was done as part of my drafting course, and they would not be kept as records if they were not done as part of my drafting course.

Q. 98. Will you please take steps to procure such drawings if they exist, together with a certificate from a proper officer of the University of Georgia, and forward the same to me at 728 California Building, Los Angeles, California, so certified at your earliest opportunity.

A. I will.

Q. 99. Further, with respect to these disclosures to you by Mr. Lamar Lyndon, in the summer of 1898, were there any of the parts and features so disclosed to you, which could not be purchased or produced in ordinary usual shop practice for the purpose of building such a governor?

A. Generators of the type necessary were not standard production; solenoids were not standard production; those two items I remember as not being standard.

Q. 100. Solenoids were built thereofore?

A. Solenoids were built theretofore.

Q. 101. And generators were of course built theretofore?

A. Generators were built theretofore.

Q. 102. And was it a question of anything more than of the winding?

A. It was a question of design of solenoid and generator.

Q. 103. And by design, do you mean anything further than winding, or what we might call broadly, field formation?

A. By design I mean the proper apportioning of winding and iron.

Q. 104. And did that involve anything further than mere specifications in these respects?

A. It involved only specifications for generator and for solenoid.

Q. 105. And was the matter of specifying such organizations usual at that time in varying the organizations of such devices?

A. Yes.

Q. 106. As to any other parts of the governor so disclosed to you by your brother in 1898, do you remember any unusual features or parts requiring special designing or production?

A. No.

Q. 107. Did your brother make any sketches or illustrations for you in the summer of 1898 while disclosing to you this water wheel governor?

A. Yes.

Q. 108. Do you know what has become of any of those sketches?

A. I do not.

Q. 109. Can you at the present time reproduce generally any such sketch?

A. I doubt it from memory.

Q. 110. I show you a blue print, concealing the identifying matter thereon, and ask you if you know what it shows? (handing witness paper.)

A. I recognize the main features of the governor, such as I remember my brother to have shown me.

Q. 111. Shown you at what time?

A. 1898.

Q. 112. Is there any relation between this governor and the one you have been describing as disclosed to you in Athens in 1898, and if so, what?

A. The general features as I see are the same.

Q. 113. Do you remember where it was in Athens, Georgia, he disclosed to you such a governor and the features thereof?

A. I do not.

Q. 114. Where did your brother reside while visiting at Athens in 1898?

A. He resided at my father's house.

Q. 115. And did you have talks with him about this governor at that house?

A. I did.

Q. 116. Do you understand the features of construction and inter-relation of parts outlined in this blue print?

A. From a short examination I made I understand the general features.

Q. 117. Please point out briefly what you gather from this blue print.

A. The generator which is a variable speed machine driven from some shaft on the water wheel, the controll-

ing solenoid receiving the current from the generator brushes; also the butterfly valve which is connected inversely to the gates and the dashpot on the butterfly valve; also the electrically operated shifting mechanism which opens or closes the gates depending on which of its coils is energized. I see in this sketch a storage battery is used for energizing the coils. I remember distinctly that the sketches shown me provided for two sources for energizing these coils; the storage battery for one and some separate source, such as the bus bars of the power station.

Q. 118. Referring to the part "friction returning device" what do you understand that part to represent?

A. The exact construction of that friction returning device I have forgotten.

Q. 119. What was its purpose?

A. To return the gate to its fixed place.

Q. 120. With what relation to the change in speed of the wheel?

A. From that sketch I don't know whether I understand the sketch and recall what that construction was but apparently I recall that to be such mechanism of fixed portion and movable portion, but I am not sure as to this construction.

Q. 121. And what effect did it have upon the gate when the gate was moved by the governor?

A. It moved the gate to a definite fixed position.

Q. 122. And what happened to the gate after it had reached this position?

A. The gate remained in that position until the change of load occurred which necessitated a different opening.



Q. 123. And when the change of load occurred, what to the wheel?

A. The tendency was for the wheel to change speed.

Counsel for Complainant: Let it be shown that the witness has just discussed photograph of Complainant's Exhibit Lyndon Reproduction Sketch of his Disclosure Sketches of June and July 1898.

Counsel may cross-examine.

### CROSS EXAMINATION.

BY MR. WESTALL:

XQ. 124. Is it your understanding that in the construction which you have referred to on your direct examination, that there was to be a constant waste of water through the by-pass valve?

A. That was a question which I asked of my brother at the time, whether there was to be a constant waste or not. I asked that question because I was working on a hydraulic electric plant at that time. Apparently he answered that satisfactorily; I don't know what the answer was.

XQ. 125. What was your understanding as to the operation of the device when an increase of load occurred on the main water wheel, that is to say, confining your answer to the operation of the main gate and the by-pass valve alone, without considering the various agencies which caused them to operate.

A. The by-pass valve opening would be decreased.

XQ. 126. And what would happen to the main gate?

A. The main gate opening increased.

XQ. 127. And then suppose that load was continued

for some minutes, what do you understand would be the relative positions of the two valves, that is to say, would they maintain that position?

Counsel for Complainant: Objected to as having already been answered by the witness, who has stated definitely the action of the dashpot and its effect upon the by-pass valve after its movement in accompanying the movement of the water wheel gate.

A. No, the dashpot returns the butterfly valve.

XQ. 128. What do you understand was to be the position of this by-pass valve during normal operation, that is to say, when the wheel was carrying a normal load and operating at normal speed?

A. My understanding was that the by-pass valve was to be partially opened, that was what was never definitely stated in the discussions with my brother; my recollection is that it was to be partially opened.

XQ. 129. Did your brother make any disclosure to you concerning any adjustment of this valve which would allow it to be completely closed under normal conditions?

A. Not in any actual values; our discussion was limited just to general features of operation.

XQ. 130. And you say your brother did not explain to you that there would be any way of stopping this constant waste of water?

A. I don't recall any definite means for stopping the waste.

XQ. 131. In order for the device to be operative, was not it necessary that there should be a constant waste of water?

Counsel for Complainant: Objected to as argumentative and as calling for a conclusion on the part of the witness, and not for a statement of facts and not proper cross-examination.

A. That was a point I brought up with him in discussion and I don't recall his answer, or what means he had taken to provide against such a method of operation.

XQ. 132. These drawings that you say were made by you during the vacation of 1898, were they exhibited at any time to your brother before they were delivered to the College instructor<sup>or</sup> to the school?

A. My recollection is that they were not.

XQ. 133. Is it your recollection that all the various means for a complete governor were illustrated in those drawings?

Counsel for Complainant: Objected to as calling for a conclusion on the part of the witness and not a statement of facts and not proper cross-examination.

A. Those drawings were not mechanical working drawings; they showed the mechanical parts, as I remember, more or less in sketch form, but without working electrical diagrams, showing all the electrical structures and how the connections were to be made.

XQ. 134. Did they show the by-pass and its butterfly valve as you recall?

A. Yes, they did show in sketch form; the drawings did not show the relation of the butterfly valve in any of its positions to gate relations; those parts were simply rough sketches.

XQ. 135. Do you mean to say that you showed all these intermediate parts in rough sketches in those

drawings, or you made separate rough sketches of those parts?

A. The drawings, as I remember, were made up of one sheet, in which only a part of the water wheel was shown; then another mechanical part, another mechanical part and all these connected electrically where electrical connections were necessary, but any mechanical connection between one part and another part, as I remember them, were not shown. In other words, it was an electrical working diagram and not a mechanical working diagram.

#### REDIRECT EXAMINATION.

BY MR. BLAKESLEE:

RDQ. 136. Were the various features, such as the dashpot, butterfly by-pass valve, by-pass water wheel gate and devices for preventing overrunning of the governor, shown or indicated in these drawings as you made in the summer of 1898?

A. My recollection is that all these parts were shown.

RDQ. 137. And were or were not enough mechanical parts shown to indicate the means of operating these several features responsive to the impulses of the electrical energization?

A. I think my drawings relate mostly to electrical wiring.

RDQ. 138. And was this wiring diagram so complete as to show the various leads, or circuit connections, or paths to the various elements I have just mentioned?

A. It was, that was the idea of the drawing.

RDQ. 139. So that there still remained as to making

working drawings the laying out of the mechanical connections which operate these several elements responsive to the several electrical impulses?

A. When I say working drawings I refer to the fact there was no dimensional drawings made.

RDQ. 140. And then, as I understand to make working drawings, would require, would it, the addition to these drawings of showing dimensions of the various parts entering into the operation of the governor?

A. It would be necessary to have the dimensional drawings.

RDQ. 141. And could, or could not those be made by an ordinary draftsman, assuming he were given a statement of the work the governor was to do?

A. Yes, some one familiar with mechanical design.

RDQ. 142. And any one familiar with mechanical design?

A. I mean to say there was nothing particularly difficult in the design of this apparatus.

Before being excused the witness is recalled in order that there may be put to him several further direct questions.

Q. 143. What, as you understood it, in the summer of 1898, was the object of providing this by-pass and by-pass valve to work inversely to the water wheel gate of this governor?

A. That was explained to me at that time. An increase of load with the ordinary form of governor would be exaggerated by an increased gate opening, and under these conditions for a short time the velocity of the column of water through the turbine would be decreased.



Q. 144. And what did you understand would occur when the gate opening was decreased?

A. That the velocity would increase.

Q. 145. And these decreases and increases in velocity would have what effect upon the wheel?

A. It would give changes in speed that were just inverse to the ones that were wanted.

Q. 146. And was anything said at that time with respect to inertia stresses in the pipe line incident to moving water wheel gates in opening and closing directions?

A. Yes, that was one of the features that was new to me at the time and my brother explained how the sudden closing of the gates would cause the rupture of a pipe line, or the opposite might cause the collapse of the pipe line.

#### CROSS-EXAMINATION.

BY MR. WESTALL:

XQ. 147. Had you given any further special study to those problems prior to that time?

A. Yes, I was doing actual work on a hydraulic development as a part of my College engineering course, and it was just at that time, or just previous to that time that I had been designing gates and a turbine equipment.

At this point it was stipulated by and between Counsel for the parties to this suit, they having investigated the matter, that there are no records of the American Trading Company of New York City, New York, with which the witness Lyndon has testified he was connected in the year 1898 in existence at this time as and of that year 1898 or the year 1899.

At this point an adjournment was taken until the hour of nine o'clock A. M., May 29th, 1915, at the office of the Legal Department of the York Manufacturing Company at York, Pennsylvania; and an adjournment likewise being taken pursuant to stipulation appearing upon the record of this day to the hour of ten o'clock A. M. May 29, 1915, at the office of Knight Brothers, 2 Rector street, New York City.

Met pursuant to adjournment and stipulation before M. E. Woardell, Notary Public and Reporter, at the office of Knight Brothers, 2 Rector street, New York City. New York, at the hour of ten o'clock A. M., May 29, 1915.

Owing to professional engagement of the witness Harry E. Knight, an adjournment was taken to the hour of 12:30 P. M., May 29, 1915, same place, before same officer.

Met pursuant to adjournment and stipulation before M. E. Woardell, Notary Public and Reporter at the office of Knight Brothers, 2 Rector street, New York City, at the hour of 12:30 o'clock P. M., May 29, 1915.

HARRY E. KNIGHT, a witness produced on behalf of Complainant in rebuttal, being duly sworn, testified as follows in accordance with stipulation between the parties:

#### DIRECT EXAMINATION.

Q. 1. Please state your full name, age, residence and occupation?

A. Harry E. Knight; 54; Boonton, New Jersey; lawyer.

Q. 2. How long have you been connected with the

firm of Knight Brothers, attorneys at law, of 2 Rector street, New York City, New York?

A. I have been at 2 Rector street some six or seven years; I have been connected with the firm since 1879.

Q. 3. Are you acquainted with Lamar Lyndon, a consulting engineer of New York City, New York, patentee of United States Letters Patent No. 695,220?

A. I am.

Q. 4. Did you, or your firm, or its predecessors, prepare and file said application for United States Letters Patent 695,220?

A. Yes, my present firm prepared that application

Q. 5. Can you state when you, or your firm, or its predecessors received from Mr. Lyndon instructions and data for the preparation and filing of this application, and if so please state?

A. We received such instructions and data on July 7, 1900.

Q. 6. What was the cause of delay in filing of said application from the time you received such data and instructions?

A. The delay does not seem to have been unusual. The file wrapper which I herewith produce, shows that the instructions were received on July 7, 1900, as already stated; that consultations were had on several occasions and attention given to the case during July and August; that on August 6 and 7 a specification was prepared, this latter entry being in pencil in my brother A. P. Knight's handwriting, and that the papers were executed September 8, 1900, of the same year, only two months after receipt of the papers. During this time apparently a con-

siderable part of the work was the preparation of drawings. The drawings were quite intricate and I see by a carbon copy of letter in this file wrapper, dated August 8, 1900, that they may not have been completed at that date. I deliver to the Notary, who is taking this deposition the file wrapper, I have produced, with all of the papers contained therein. These papers include the official and unofficial correspondence, all of which are attached to the file wrapper, and also a number of detached papers, all of which are in the condition in which they were when the papers in this case were filed away on the completion of our attention to the application and the securing of the patent in March 1902, that is to say, all the papers herein were in the file at that time and in their present condition. All of the dates which appear upon the several letters and other papers are, I believe, correct and the stamp which appears on some of the papers Received, and then the date, and the word abbreviation of Knight Brothers, is the correct stamp of the firm, and was to my best knowledge and belief applied on the several dates which appear on the respective papers. The pencil notes upon the back of the loose paper marked "Description and Claim Re Electro Mechanical Wheel Governor" are in my handwriting. (Witness produces records.)

Q. 7. Was or was not Mr. Lyndon's account good with you at that time?

A. It was.

Q. 8. If Mr. Lyndon failed to pay your fees or the expense of this application, or delayed in the payment of same, was the work of preparing and filing this application consequently delayed, or materially delayed?

A. Not on that account, and I do not think it was materially delayed on any account.

Q. 9. Can you produce any records which pertain to the matter of this application for said Lyndon Letters patent?

A. I have produced them in answer to a former question and delivered them to the Notary Public taking this deposition.

Q. 10. Do these records show any dates pertinent to the receipt of instructions for the preparing and filing of said Lyndon application, and the work of yourself, or your firm or its predecessors in connection with the preparation and filing of said application? If so, please state what these dates are in each instance, and deliver such records to the Notary to be received in evidence in this case and duly marked by her.

A. The record does contain such dates, and the papers have been delivered to the Notary as requested, and I may say in explanation that the file wrapper is itself explanatory. At that time the history of cases was kept by my office directly upon the file of the case, which contained a statement of the proceedings in the case, and of the charges; all this will be found on the turned in page of the file wrapper and all the entries therein are to my best knowledge and belief true and correct. I recognize all the handwriting as that of various employees of my firm during the period of the pendency of the cases in the office.

File wrapper marked Complainant's Exhibit Knight Brothers Lyndon Records.



CROSS-EXAMINATION:

XQ. 11. In answer to the last question of your direct examination have you produced all of the records or papers in your custody, or under the control of your firm, or its predecessors relating to said application for United States Letters Patent granted to Lamar Lyndon No. 695,220?

A. Yes, although I may add that I find an old ledger account in which are transcribed the items which here appear.

XQ. 12. If not I will ask you to produce all letters, instructions, drawings, writings, or other written matter comprising your file relating to said Lyndon application?

A. The above is already answered.

XQ. 13. Have you any independent recollection of any of the circumstances, or of the dates connected with or surrounding said application further than as testified to in your direct examination, and if so, what?

A. I have not.

XQ. 14. Where have these files, records and drawings produced by you in answer to the last question on direct examination and the first question on cross-examination been since the grant of said Lyndon patent No. 695,220?

A. When the patent was granted the papers were filed away in a file away box in my office, and a number of years ago were sent with other papers out to the storage place at my home where they have remained until today.

XQ. 15. Have all these files, records, instructions,

sketches and drawings been in the possession of your firm, and its predecessors continuously since the matter of said application was placed in the hands of your firm, or its predecessors?

A. They have been in my firm's possession ever since the date referred to.

XQ. 16. If not, please state where such files, papers, instructions, drawings, sketches and records have been from the time such matter was first placed in the hands of your firm, or its predecessors, up to the present date?

A. I have already answered this question.

XQ. 17. Have you had any communication from Mr. Lamar Lyndon, or anyone interested in any way in said application for Letters Patent 695,220 during the last year, and if so, what?

A. Someone, I think, during the last year mentioned to me that this patent was in litigation. I believe it was Mr. Lyndon. The conversation, as I recollect it, was a casual one and called for and received no attention on my part.

XQ. 18. In answer to the last question, have you described fully all correspondence or conversations which you have had with anyone interested in said application for Letters Patent referred to, and if not please state fully any other correspondence, communications or conversations that you have had relating to the same?

A. I have done so, excluding, however, from this the conversation had yesterday with Mr. Blakeslee, who merely requested me to find and produce these papers which request I have now complied with.

XQ. 19. Are all of the files, records, papers, letters,

instructions and sketches heretofore produced by you in answer to previous questions of this deposition in the same condition as they were originally, by which I mean have any alterations or additions been made to any drawings, sketches, letters, instructions or other papers comprising the same, and if so, what?

A. None to my knowledge and I believe the papers are in the exact original condition.

XQ. 20. Please explain how you fix the date by reference to any of said papers comprising your files and records, of said Lyndon application, of the time when such matter was first placed in the hands of your firm, or its predecessors?

A. The file wrapper shows the entry in the handwriting of the then file clerk of the office under date "1900 July 7 Ins. Rec'd." This was an entry by the file clerk under my instructions when instructions were received for proceeding with the application for patent. I recognize this, therefore, as the date of the beginning of this case in the office. I further remember that the instructions for the case were received from Mr. Lyndon and by reference to this date to refresh my memory, I am able to state that the instructions were received on July 7, 1900.

STATE OF NEW YORK, County of New York. ss:

M. E. WOARDELL, being duly sworn, deposes and says that she is a notary public in and for the County of Kings, State of New York, duly authorized to act within the County of New York duly authorized to administer oaths, and that she is a citizen of the United States and a resident of the Borough of Brooklyn, County of Kings,

City and State of New York; that the foregoing depositions of Hillary C. Messimer, Henry C. Meyer, Jr., Edward Lyndon and Harry E. Knight were taken before her commencing at the hour of two o'clock P. M. on May 24, 1915, at the office of Henry Escher, Jr., 26 Exchange Place, New York City, New York, and at the other times and places, all as appear in connection with said foregoing depositions; that there were present Raymond Ives Blakeslee, Esq., Solicitor and Counsel for Complainant, and Joseph F. Westall, Esq., Solicitor and of Counsel for Defendant; that the said witnesses were duly sworn by her before commencing their said depositions, to tell the truth and nothing but the truth; that the said depositions of said witnesses and the proceedings had in connection therewith were written out stenographically by her and were reduced to typewritten form by her; and that said depositions and record in connection therewith are a full and complete record of said depositions as taken and the proceedings had and taken in connection therewith; that she duly certified the Exhibits offered in connection with the taking of such depositions; that she is not connected with either of the parties to said suit in which said depositions were taken in any manner as attorney, or otherwise, or is not directly or indirectly interested in the event thereof, nor is she related to either of said parties by marriage or other wise. She further certifies that the deposition of Earl A. Merrill, after he had been duly sworn before Lloyd Thompson, Master in Chancery for the State of New Jersey, was taken at Number 121 Prospect Street, Westfield, in the State of New Jersey. She further certifies that the deposition of said Earl A. Merrill, with

the proceedings thereon as well as the other records, is a full, true and complete record thereof, and that she is returning all of said depositions together with the duly certified deposition of one Thorburn Reid returned to her by Frederick T. Cramer, Notary Public, to the Special Examiner in this case, together with the Exhibits certified by her.

Subscribed and sworn to before  
me this 13th day of July, 1915.

M. E. Woardell.

Robt. Connor

Notary Public

Kings County

Certificate filed in New York County

New York County No. 118

New York Register No. 6215.

Notarial Seal.

County Clerk's Certificate Attached.

*{ omitted }*



IN THE UNITED STATES DISTRICT COURT,  
SOUTHERN DISTRICT OF CALIFORNIA,  
SOUTHERN DIVISION.

GEORGE J. HENRY, JR.,

Complainant,

vs.

CITY OF LOS ANGELES,

Defendant.

IN EQUITY,

No. A-87.

SUPPLEMENTAL OATH AND CERTIFICATION.

STATE OF NEW YORK, Count of New York. ss:

M. E. Woardell, being duly sworn, deposes and says:

That she is a Notary Public in and for the County of Kings, State of New York, duly authorized to act within the County of New York, State of New York, and duly authorized to administer oaths, and that she is a citizen of the United States and a resident of the Borough of Brooklyn, County of Kings, City and State of New York; that the foregoing depositions of Hillary C. Messimer, Henry C. Meyer, Jr., Edward Lyndon, Harry E. Knight, and Earle A. Merrill, were taken before her, commencing at the hour of two o'clock P. M. on May 24th, 1915, at the office of Henry Escher, Jr., No. 26 Exchange Place, New York City, New York, and at the other times and places mentioned, all as appear in connection with said foregoing depositions; that there were present at the taking of each of said depositions, Raymond Ives Blakeslee, Esq., Solicitor and Counsel for

Complainant, and Joseph F. Westall, Esq., Solicitor and of Counsel for Defendant; that the said witnesses with the exception of Earle A. Merrill were duly sworn by her before commencing their said depositions, to tell the truth, the whole truth and nothing but the truth; that the said depositions of said witnesses and the proceedings had in connection therewith, were written out stenographically by her and were reduced to typewritten form by her; and that said depositions and record in connection therewith are a full, true and complete record of said depositions as taken and the proceedings had and taken in connection therewith; that she duly certified the Exhibits offered in connection with the taking of such depositions; that she is not connected with either of the parties to said suit in which said depositions were taken, in any manner as attorney, or otherwise, nor is she directly or indirectly interested in the event of said suit, nor is she related to either of said parties by marriage or otherwise, that the said deposition of Earle A. Merrill was taken at No. 121 Prospect Street, Westfield, in the State of New Jersey, being the office of said witness Earle A. Merrill, and that said Earle A. Merrill, who gave such deposition, was first duly sworn before Lloyd Thompson, in the presence of affiant, said Lloyd Thompson being a Master in Chancery of the State of New Jersey, and duly authorized and commissioned to administer oaths, and that said Lloyd Thompson neglected to himself and separately certify said deposition of said Earle A. Merrill, taken before him as well as any Exhibit offered in connection therewith, offering as his excuse the refusal of the witness to read over his said deposition, which reading

over of said deposition has, as pointed out to said witness and Thompson, been waived pursuant to stipulation between the parties to this suit approved by the Court; and that she has returned all of said depositions together with the foregoing duly certified deposition of one Thorburn Reid, returned to her by Frederick T. Cramer, Notary Public, to the Special Examiner in this case, together with the Exhibits certified by her.

M. E. WOADELL,

Notary Public.

Subscribed and sworn to before me  
this 27th day of July, 1915.

R. C. OTHEMAN,

Notary Public No. 2879

New York County.

(SEAL)

My Commission Expires 30th <sup>March</sup> ~~July~~, 1916.

Co. Clerk's Cert. Attached.

IN THE UNITED STATES DISTRICT COURT,  
SOUTHERN DISTRICT OF CALIFORNIA  
SOUTHERN DIVISION  
IN EQUITY No. A-87

GEORGE J. HENRY, JR.,

Complainant,

against

CITY OF LOS ANGELES,

Defendant.

DEPOSITIONS OF HILLARY C. MESSIMER,  
EARLE A. MERRILL, HENRY C. MEYER, JR.,  
THORNBURN REID, EDWARD LYNDON AND  
HARRY E. KNIGHT.

Office of I. Benjamin,

310-313 International Bank Building,

Los Angeles, Cal., Wednesday, August 25, 1915.

10 o'clock a. m.

Testimony taken on behalf of the defendant in the above entitled cause on surrebuttal, pursuant to the order of Court and notice heretofore served, at the office of I. Benjamin, the Special Examiner, 310-313 International Bank Building, Los Angeles, California, beginning at 10 o'clock A. M., August 25, 1915.

Present:—

Raymond Ives Blakeslee, Esq., Solicitor for complainant.

Joseph F. Westall, Esq., Solicitor for defendant.

WILLIAM F. DURAND, being first duly sworn according to law, testified on behalf of defendant as follows:

#### DIRECT EXAMINATION

By Mr. Westall:

Q. 1. State your name, age, residence and occupation.

A. William F. Durand; age, fifty-six; residence, Stanford University, California; occupation, Professor of Mechanical Engineering at Stanford University.

Q. 2. What education, experience, or training, have you had, if any, which would tend to qualify you to testify as an expert in a case involving an electromechanical water-wheel governor.

Mr. Blakeslee: Objected to as leading. Let the witness state his general qualifications.

A. First, as to education, a high school course at Derby, Connecticut, graduating in 1876, followed by entrance to the Naval Academy in the regular course as a cadet at that institution, graduating in 1880; then, as to experience, broadly, service in the engineering corps of the navy from 1880 to 1887. Since that date, or during the past twenty-eight years, teacher of engineering classes and subjects in college courses and incidentally consulting practice. I might then refer more specifically to certain matters relating to familiarity with electrical subjects. First, special and thorough training in theoretical and fundamental principles; advanced courses of reading with special reference to mathematical theory; the duty of arranging courses in electrical engineering at the Michigan State College and teaching courses in electrical engineering at that institution. Again, more recently, the teaching of a course in electrical engineering at Leland Stanford, Jr., University, my present location. Again, authorship of a number of articles or papers on electrical subjects which have been published in technical journals. Again, a life long working familiarity with the elements of electrical apparatus, especially such as are employed in the devices shown in the Lyndon specification. Turning now to experience more directly related to hydraulic engineering, I note these items: wide reading and study in the general field of hydraulic engineering; second, the teaching of classes in hydraulic engineering in Stanford University; third, familiarity by personal visit or by reading with important hydraulic power plant prac-



tice, both in this country and in Europe; fourth, consulting relations with a number of hydraulic power-plant projects, among which I may mention the Los Angeles aqueduct, the San Francisco Hetch Hetchy power project, and the United States Interior Department Reclamation Service, Columbia River project; fifth, I am under present contract to write a textbook for a London publishing house dealing with pipe lines in connection with hydraulic power plants, and am at present engaged on that work; sixth, with special reference to matters of hydraulic power plant governors, some few years ago I became specially interested in these matters and made a collection of the important American patents relating to such governors for the purpose of study and comparison. Immediately thereafter, for the purpose of classroom demonstration in connection with my work at Stanford University, I prepared or caused to be prepared a model showing the fundamental principles of operation embodied in modern hydraulic power plant governors. I think those items cover the chief points which might be of interest.

Mr. Blakeslee: Let it be noted that the witness is apparently referring to notes on the giving of his deposition, and that if this is to continue throughout the deposition we wish the record so to show. If it is not to continue, the witness may so state.

Q. 3. By Mr. Westall: Will you please state to what paper you referred in giving your answer, and also state whether it is your intention to continue the use of such paper or notes during the course of your examination, and also state the considerations which lead you to adopt that course.

A. The notes to which I refer are notes which I have made on the subject of the suit in issue in the interest of economy of time and clearness of statement. I have prepared these notes with my own hand and they represent my unbiased personal opinion uninfluenced by any external source. In the interest of economy of time and clearness of statement I desire to continue the use of these notes throughout the deposition.

Mr. Blakeslee: We are not so much concerned in the economy of time, and as to clearness of statement it apparently is the intention of the witness to signify that clearness of statement in his case is dependent upon the use of pre-arranged or formulated notes. As long as the record shows that the witness will refer to such notes during the course of his deposition, the matter needs no further comment.

Q. 4. By Mr. Westall: These notes are to be referred to, are they not, for the purpose of aiding your memory to completely state different facts inquired about, are they not?

A. They are.

Mr. Blakeslee: Then we understand that the witness is not to testify from his own memory, unaided by the assistance of notes, and that his deposition is not to be a spontaneous statement of facts or opinions, but to be a recitation of previously worked out findings, and we object to this method of proof as not proper and ask that the Court in considering this deposition take into consideration the nature of its development as above set forth.

Mr. Westall: Counsel for defendant merely suggests

that the testimony of any expert witness consists of a re-statement of previously worked out findings.

Q. 5. I now place before you Complainant's Exhibit A, being a copy of the Lyndon patent in suit, and ask you if you have read and examined and if you understand the device therein described and illustrated.

A. I have read and examined this patent and I believe I understand the device therein described.

Q. 6. Will you please examine Complainant's Exhibit A, being the patent in suit, and briefly describe the nature of the device therein shown and described?

Mr. Blakeslee: Objected to as not surrebuttal and strictly outside of and entirely outside of the motion for leave to take surrebuttal proofs, and likewise entirely outside of the limited order permitting such surrebuttal proofs, which order is made a part of this objection, and we give notice that we shall stand strictly on the terms of such order which deals specifically with the exhibit of the model device of the Lyndon patent and its organization and its attributes and operative-ness, and its general relation to the patent in suit, without permitting a lengthy excursion into the construction, inter-relation and mode of operation of the patent in suit. In other words, we at this time strenuously object to any further interpretation on behalf of the defendant of the patent in suit, and insist that the surrebuttal testimony be limited to a comparison of the Lyndon patent exhibit model with the disclosures of the Lyndon patent as heretofore interpreted and placed upon the record by the witness in this case. We wish to make it clear that our objection goes in toto to any fur-

ther digesting of the patent in suit on surrebuttal, and that it must be limited to a consideration of said Lyndon patent exhibit model in the light of, for the purpose of comparison, the expounding of the disclosures of said Lyndon patent which have heretofore been made of record. This objection will be understood as repeated to each and every question which goes beyond the pale of the metes and bounds set forth in such objection, without the necessity of elaborate repetition.

Mr. Westall: Counsel for defendant suggests that there is a wide divergence in many respects between the interpretation placed upon the Lyndon patent in suit by the witnesses for complainant and those of the defendant. In order that the objects of this surrebuttal testimony may be attained, it is necessary for the witness to explain his understanding of the patent in suit and the interpretation he places upon the language of the specification. Without such explanation any comparison between the structure of the Lyndon patent in suit and Complainant's Exhibit Operating Model of Invention Disclosed by Complainant's Exhibit A, Copy of the Lyndon Patent in Suit, which, with consent of complainant, we will hereafter refer to as "Lyndon Patent Model," (to which designation of said model counsel for complainant consents), would hardly be possible.

Mr. Blakeslee: We still insist that the defendant has had its day in court in the analysis of the Lyndon patent in suit, and that such Lyndon patent in suit speaks for itself in so far as it is to be considered in comparison with the Lyndon Patent Model; and we insist that



the proper procedure on surrebuttal is for this witness to state what he finds in common, or otherwise, as between the Lyndon Patent Model and the disclosure of the Lyndon Patent in suit, without, under cover of such comparison, adding to the record what properly might have been adduced, if at all, by the defendant in its proofs in chief.

A. I will first very briefly state that the device as a whole, disclosed by the Lyndon patent, is intended to regulate and control the speed of a hydraulic power plant or prime mover, and that it contains the following essential elements; a speed-sensitive device comprising a dynamo and connected parts, which is connected by belting or mechanical means to the prime mover, and therefore varies in speed responsive to variations in the latter. The variation in speed of the speed-sensitive device produces a change in degree of magnetization of a solenoid which results in the movement of the solenoid core, which movement produces certain electrical contacts the closure of which serves to energize certain magnets, the energization of which serves to set in operation a train of movements which is intended to bring about a regulating or controlling operation on the speed of the prime mover. Such are the main items of the primary function of the Lyndon disclosure. There is in addition, and which lies at the foundation of the theory of governing disclosed by Lyndon, a so-called by-pass and by-pass valve which is intended to move inversely to the movement of the main gate, thereby minimizing the rate of change in the velocity of the water in the main conduit flowing to the prime mover and reducing or elimin-



ating variations of pressure in the same during the period of governing.

Q. 7. By Mr. Westall: You have mentioned a by-pass. Will you please state a little more fully the manner in which such by-pass is evidently intended to “minimize the rate of change in the velocity of the water in the main conduit” as you have described in your last answer.

Mr. Blakeslee: The same objections as last noted.

A. It is well known that in the operation of governing hydraulic power plant prime movers, variations must be made in the rate of supply of water to the wheel. This implies variations in velocity. Variations in velocity imply variations in pressure. In particular, if a prime mover is operating at, for example, half load, and there comes a sudden demand for full load, the water for said increased demand will not be present at or near the prime mover unless some special provision is made for supplying it at that point. Furthermore, if the prime mover is operating at full load and there is a sudden rejection of one-half the load and the necessity of closing the gate to a corresponding amount, the excess water must be taken care of in one way or another, because the velocity in the main conduit cannot be instantaneously arrested, for, if an attempt be made to arrest such velocity too suddenly, a serious increase in pressure will result. In the device disclosed in the Lyndon patent these difficulties are intended to be surmounted by placing in a by-pass just back of the main gate a by-pass valve normally held in a half-open position. The water which flows along the main conduit then goes partly to

the wheel and partly through the partly opened by-pass. In the case I first mentioned—that of sudden change of half-load to full load—enough water will be available in the conduit itself, and it will be only necessary in order to make it available for the wheel to close or partially close the by-pass valve, thereby preventing it from wasting through the by-pass, and turning it to the wheel. On the other hand and in the reverse case of a sudden change from full load to half-load, the excess water which is going along the main conduit may be disposed of by simply opening the by-pass valve still more widely, thereby allowing such excess to waste through the by-pass while the reduced amount of water, as controlled by the main gate, will pass to the wheel.

Q. 8. By Mr. Westall: What have you to say as to the coincidence of movement or lack of coincidence of movement between the main gate of the Lyndon patent and the by-pass valve of said patent?

Mr. Blakeslee: The same objection as last noted and also that it is indefinite.

A. Coincident movement of the by-pass and of the main gate is necessary to the fundamental theory of governing as disclosed in the Lyndon patent, as may be apparent by reference to the answer to the preceding question. In further support of this view, I desire to quote certain passages from the Lyndon patent in suit, as follows:

On page 1, lines 28 to 35, “I provide a by-pass inserted into the penstock or flume at a point near the water-gate and a gate in the said by-pass controlled by the same governing mechanism that controls the water-gate

and operating to allow a greater or less flow through the by-pass, according as the water-gate is being closed or opened." In this connection I may call attention to the co-relation involved in the last few lines of the quotation: "A greater or less flow as the water-gate is being closed or opened." If these statements are read separately, we find that the disclosure implies a greater flow as the water-gate is being closed and a lesser flow as the water-gate is being opened.

Again, on page 4, lines 16 to 22, "When the gate is operated, as above described, the lever 43 is moved to close the contacts 45a 46a 100 101, this closure being effected whatever the direction of movement of the controlling lever 26 by reason of the pin and curved slot connection between such levers."

Again, on page 4, lines 31 to 34, "Consequently the by-pass valve will be turned toward open or shut position, according to whether the gate is closing or opening, for the purpose above stated."

Again, page 4, lines 40 to 49, "When the governor acts to close the main gate, the compensating device will open more widely the by-pass. The rapidity with which the valve in the by-pass opens is such that the increased volume of water which it allows to pass through is proportional to the decrease in area which the main gate effects by reason of its closing. Should the main gate open, a reverse action takes place."

Again, on page 4, lines 74 to 80, "It is obvious that the by-pass, arranged as described, opening or closing in a manner opposite to that in which the main gate opens or closes will, if properly adjusted, admit of the

main gate being rapidly operated and the governing of the water-wheel quickly accomplished."

Again, on page 5, lines 73 to 77, " . . . and adapted to operate the by-pass valve from normal position in either direction so as to control such valve inversely to the control of the water-gate, during the governing action of the water-gate."

Q. 9. By Mr. Westall: Do you find any suggestion anywhere in the specification or claims of the Lyndon patent in suit that the by-pass valve is not to be moved at the same time as the main gate?

Mr. Blakeslee: The same objections as previously noted, and also that it is leading and not the proper method of proof.

A. I do not find any such suggestion, but, on the contrary, I believe that any suggestion of other than simultaneous operation would be subversive of the theory of governing as disclosed in the Lyndon patent.

Q. 10. By Mr. Westall: Please describe the functions of the ~~governor~~<sup>generator</sup> or dynamo 8 of the Lyndon patent in suit as you understand it.

Mr. Blakeslee: The same objections as previously noted.

A. The function of the generator is to provide an element sensitive to varying speed in the prime mover. and to set in operation a train of movements which will bring about control or regulation of speed.

Q. 11. By Mr. Westall: Please point out and designate in the patent in suit the "returning device" mentioned in claims 3, 4 and 5 of the Lyndon patent.

Mr. Blakeslee: The same objections as previously



noted, and, furthermore, that it is a specific attempt to arbitrate the specific claims of the patent in suit, which is not proper in surrebuttal, and as leading and calling for a conclusion on the part of the witness other than an expert conclusion.

A. In my understanding of the Lyndon patent, the returning device is the rod 25 which effects the specific operation of return.

Q. 12. By Mr. Westall: Please explain the apparent conflict of your last answer with the statement of Lyndon in the specification at line 116, page 3, where the discs 22 and 23 and the clutch magnet 32 are apparently included as a part of the "returning device."

Mr. Blakeslee: Objected to as leading and not the proper method of proof, and an attempt to coach the witness rather than to leave to him in the examination of the patent discovery as to anything which may or may not conflict with his testimony, not the proper method of proof, and, furthermore, on each of the main grounds of objection heretofore urged.

A. Throughout the patent I find a large number of errors and inconsistencies in the use of language. I assume that the conflict to which you refer is simply another illustration of this looseness or inexactness of phraseology which is found in several places in the specification and description of the patent in suit. I conclude that the rod 25 should be considered the returning device primarily for two reasons. First, the balance of the evidence as drawn from the phraseology of the patent in suit and in support of this I will refer to the following points quoted from the patent. On page 2, line 12, "A returning



device consisting of a rod 25, connected" etc. This language seems clearly to restrict the returning device to the rod 25. On page 2, line 20, where the language of the specifications continuing the discussion of this general operation states: "where springs 29 29 are placed between collars 29a 29a on the rod" etc. This language seems to exclude the springs, since they are specifically mentioned otherwise. Next, on page 4, line 12: ". . . . to de-energize the clutch-magnet for the returning device." This language seems to clearly exclude the clutch-magnet. Again, in claim 3, 4 and 5 the magnet is specifically mentioned and claimed independent of the returning device. Further, in claim 4, reference is made to a returning device provided with actuating means. This seems clearly to differentiate the rod from the means involved in its movement.

My second general reason for concluding that the device is limited to the rod 25 or, possibly, the rod 25 with the extension and link 25a is furthermore based on a general analysis of the operation of this device with reference to the normal use of language. It is clear that a returning operation is implied, and the purpose of the language employed is to designate the direct agent which operates or brings about this operation of return. It is clear that rod 25 or 25 with 25a is such agent. I furthermore distinguish the <sup>agent</sup> 25 and 25a from the means which serve to make the same operative, for the reason that if such means are to be included there is no reasonable limit to the extension of such inclusion. Thus, the clutch 22 23 serves directly to move the returning rod 25; the lever 24 serves to bring into operation the clutch 22 23; the magnet 32 serves to move the lever 24; the circuit

102 serves to energize the magnet; the contacts 45 46 serve to permit the current to flow; the lever 43 serves to make such contacts; the lever 42 serves to actuate lever 43; the rod 36 and core 34 serve to actuate lever 42; the solenoid 33 serves to move core 34; the electric currents from the dynamo 8 serve to vary the magnetic field of 33, thus producing movement in 34; the belt serves to give varying speed to the dynamo 8, thus producing such variation in the electric current; the belt is operated from the shaft 6, which, again, takes its movement from main shaft 3, and thus we trace the entire chain of operation back to the variation in speed of the main drive-shaft 3. Thus, in the ultimate sense, the variation of speed in the main drive-shaft 3 serves to operate the returning rod 25; and if the returning device is to include the rod and the features which makes the same operative, it must logically include the entire train of elements which I have mentioned. There is no more reason for omitting one than another. I come, therefore, to my first conclusion that, having due regard to the use of language, we must construe the term "returning device" as restricted to the agent which directly effects the operation of return, and this is the rod 25 with its connected link 25a.

Mr. Blakeslee: We move to strike out the entire answer of the witness on each of the grounds of objection urged against the question, and, furthermore, as not responsive, up to the first occurrence of the words "I conclude", and, furthermore, as improper testimony, particularly in surrebuttal, in dealing with an attempted interpretation of the meaning of several of the claims referred to by the witness. And we point out particu-

larly in connection with this answer that under the guise of surrebuttal the defendant is apparently attempting to add things which he might or might not properly have attempted to add in his main proofs, and which cannot be done under any circumstances in surrebuttal, and particularly in surrebuttal the metes and bounds of which have been specifically and limitedly defined by the order of the Court under which the present proofs are permitted to be introduced.

Q. 13. By Mr. Westall: What do you understand is meant by the element described as "a controller" of claims 3, 4, 8 and 9, and the "circuit controller" of claim 5?

Mr. Blakeslee: The same main objections as to the nature of these attempted proofs as previously made.

A. I interpret such term to refer to the lever 26.

Q. 14. By Mr. Westall: Will you please state your reasons for selecting the lever 26 as such "controller" or such "circuit controller"?

Mr. Blakeslee: The same objections as last noted.

A. I draw such conclusion primarily from an interpretation of the language of the patent specification in suit, and I refer specifically to certain quotations as follows: On page 2, line 27, "to exert pressure on the controller 26 to return it to normal position." At this point the language of the description specifically refers to the controller by the number "26." Again, on page 2, line 43: "to the lever 26, which acts as a circuit-controller." Again, on page 3, line 62, "to hold the controlling-lever 26 in its mean position." Again, on page 5, line 18, "actuated by

said controller on movement thereof from normal position to engage said clutch with said shaft." In claim 4, line 32, "said controller provided with actuating means." In this language the "actuating means" seems to be differentiated from the controller itself. In claim 5, line 45, "a core for said solenoid and a circuit-controller actuated thereby, springs for holding the circuit-controller in normal position." Here, likewise, the controller 26 seems to be clearly differentiated from those elements with which it is immediately connected. In claim 9, line 115, "an electro-magnetic device connected to said dynamo, a controller operated by said electro-magnetic device and controlling the said reversing gear." Here again the controller 26 seems to be differentiated from the means which are used to render it operative.

Q. 15. By Mr. Westall: Do you find anywhere in the patent in suit any warrant for believing that the solenoid 33 is intended as the "controller" or "circuit-controller" of claims 3, 4, 8, and 9?

Mr. Blakeslee: We move to strike the last answer of the witness out on each of the grounds of the main objection previously urged, and on the ground previously urged, particularly, that any testimony produced at this time pertinent to the interpretation of any of the claims of the patent on suit is improper and, if at any time proper, not now proper under the limitations imposed by the order permitting the taking of surrebuttal proofs. Likewise, we object to the last question on each of the grounds of the main



objection previously urged, and as leading and not the proper method of proof. It will be perfectly clear from the nature of this last question that any interpretation of the claims mentioned can have nothing to do whatsoever with a discussion of the construction and inter-relation of the parts and features of the Lyndon patent model as it stands, in physical representation of the Lyndon device. This examination is still more apparently going into abstruse questions of construction of letters patent and the claims thereof, rather than dealing with the said exhibit and its physical characteristics.

Mr. Westall: Counsel for defendant suggests that this suit is based upon the claims of the patent, and the question is whether the Complainant's Exhibit Lyndon Patent Model contains the combination of elements called for by such claims, reading such claims in the light of the specification and drawings of the Lyndon patent. The question calls for the understanding of the witness of these different claims in order that a proper basis may be laid for such comparison.

Mr. Blakeslee: The complainant is not attempting nor has he attempted to anticipate the Lyndon patent in suit by constructing the Lyndon Patent Model, and this procedure in surrebuttal cannot go into an interpretation of the invention of the patent in suit, particularly as defining the claims, and then compare such invention technically speaking with such patent in suit. The sole question to be considered in this surrebuttal procedure is the nature and



structure of such Lyndon Patent Model, what it will do and what it will not do, and whether any features thereof do or do not operate, and in such operation or non-operation as may be found, whether specifically there is any contradiction between the actual disclosure of the specification and claims of the patent in suit. Manifestly there cannot have been any attempt by complainant in this case to organize such Lyndon Patent Model as a composite structure exemplifying the entire art of water-wheel governing within the scope of the claims of the Lyndon patent in suit; and it must be apparent that to so contemplate this structure would leave open for consideration all those other near or far approaches to said model as might come within the legal import of such claims. In other words, this model is meant to show the construction and inter-relation of parts and features specifically set forth by the specification and drawings of the patent in suit, as near as the same can practically be put together upon the small scale of the exhibit model, and is not intended to typify the entire step taken in the art by the patentee Lyndon within the large scope and range of equivalence falling within the language of the several claims. We insist that this procedure must be limited to the consideration of the elements and things found in and assembled in the Lyndon Patent Model, and cannot properly contemplate the voluminous features and things which might be present in a vast number of structures which might fall within the legal import of the several claims of the patent in suit.

Mr. Westall: The Complainant's Exhibit Lyndon Patent Model was introduced on rebuttal as an attempted answer to defendant's contention of the combination of elements called for by the claims in suit, put together and connected by the mechanical means described in the Lyndon patent specifications, are inoperative and impracticable; and the testimony now being taken is to show that said model is not an answer to the defendant's contention, in that it does not involve and contain the combination of elements called for by the respective claims, nor the the means by which such separate elements are connected.

Mr. Blakeslee: We insist that this inquiry can only concern the finding or non-finding in the Lyndon Patent Model of specific elements described and pictured in the Lyndon patent in suit, such, for instance, as the electromagnet 32, the power shaft 6 and the clutch 9, 10 and 11, and that this inquiry cannot go into the contemplation of whether or not this Exhibit Model has or represents all of those things which might be equivalent to the parts last mentioned, or any of them, and that therefore, while the Lyndon Patent Model is of course intended to represent the subject of the claims, it is so intended to represent the said subject of the claims because it follows the teachings of the specifications and drawings and not because more generally it represents the teachings of such claims. In other words, under the guise of surrebuttal the defendant cannot treat of the scope and metes and bounds of the

claims, but must treat of those portions of the patent disclosure which are defined by the statute as the specification and drawings, which are distinguished from the claims as such. There is only one Lyndon Patent Model before us, and therefore the defendant cannot at this time consider all of those other Lyndon patent models which might be organized, dealing with the vast number of embodiments possible within the claims of the patent in suit.

A. I do not, and for the reasons which I have sufficiently given in my answer to the preceding question.

Mr. Blakeslee: We move to strike out the answer on each of the grounds urged in the objection.

Q. 16. By Mr. Westall: Please point out in the Lyndon patent in suit the elements described in claims 6 and 7 as "means connected to the water-gate;" also the element referred to in claim 8 of the patent as "an operating device for said valve"; also the element referred to in claim 9 of said patent as "means adapted to operate the valve in either direction."

Mr. Blakeslee: The same objections as previously noted, and also as incomplete. And the further objection is made, and which is understood to be repeated to each and every question put to the present witness dealing with the claims of the patent in suit, that the witness has not qualified to answer any such question.

A. I interpret such means as comprising the

drum or sheave wheel 54 with its immediate attached parts 56 and 57, with the ropes 51 and 52.

Q. 17. By Mr. Westall: Please now point out in the Lyndon patent in suit the elements described in claims 7, 8 and 9 as "means for returning the by-pass valve to normal position."

Mr. Blakeslee: The same objections as last noted.

A. I interpret such language as referring to the weights 70.

Q. 18. By Mr. Westall: Please state whether or not you include as "means for returning the by-pass valve" spoken of in your last answer any dash-pot referred to in the patent.

Mr. Blakeslee: Objected to on each of the grounds last urged, and furthermore that it is leading and an attempt to coach the witness, in view of the nature of the last answer of the witness.

A. The function of the dash-pot is to retard or control the return slowly and easily to its position of rest. Its function is not to determine or produce such return.

Q. 19. By Mr. Westall: What do you understand is meant by the language of claims 7 and 9, reading such language in the light of the patent specification and drawings, by the phrase "in either direction" as contained in the clause "means . . . adapted to operate the by-pass valve from normal position in either direction?"

Mr. Blakeslee: The same objections as last noted, and we again insist strongly that what the witness's interpretation of these claims or the language men-



tioned may be has nothing whatsoever to do with the appearance and structure and performance of the Lyndon Patent Model which is before us awaiting the discussion of this witness, if he is to give any surrebuttal testimony in this case. ,

Mr. Westall: It is suggested that some interpretation must be placed upon the language before any comparison is possible.

Mr. Blakeslee: In reply we will say that the model is before us, and the witness can be asked whether or not, and in what respect, he finds or does not find anything in the model which he does or does not find in the patent, and whether or whether or not he finds anything in the model which does not perform in the same manner as the teaching of the patent would indicate, and that is the limit set by the order permitting surrebuttal in this case. Further, we will call the attention of the Court to the fact that in view of counsel's own admission just made that it was defendant's contention that the subject of the Lyndon patent in suit was inoperative, and that apparently Lyndon Patent Model was put in evidence to show that such subject was operative, there can be no proper adduction of proof in surrebuttal beyond the rebutting nature of the offer in evidence by complainant of said Lyndon Patent Model than to show, as the order specifies, whether or not such parts are found in the patent in suit and the specifications and drawings thereof, and whether or not the parts as put together in the model exemplify such pictured and described structure will cooperate or co-ordinate.



Mr. Westall: Do I understand from counsel's last statement that he admits that this Complainant's Exhibit Lyndon Patent Model does not attempt to show that the device of the Lyndon patent is practicable and operative?

Mr. Blakeslee: Counsel for complainant's last statement speaks for itself, and it is for defendant to make any showing in the premises which it finds possible.

Mr. Westall: I merely asked the question for the purpose of possibly saving time, because if counsel will admit that this model is no answer to our contention as to the inoperativeness of the Lyndon device, there will be no further necessity of taking any testimony concerning it.

Mr. Blakeslee: Any statement I have made is not to be considered as implying anything further or contrary to the direct assertion based upon absolute proof in this record that this Lyndon Patent Model is operative, that it exemplifies the teachings of the Lyndon patent and that it was in operative condition when it was offered in evidence in this case, since which time counsel for complainant has not come into physical contact with it. If it is not now operative, explanation is due from the defendant why.

A. The entire theory of the Lyndon patent as regards governing of a hydraulic prime mover implies the provision of a by-pass valve in normal position half-open, and the movement of such valve in either direction inversely to the movement of the main gate, and for purposes which I have fully explained

in my answer to a previous question. I will furthermore, however, refer to the language of the patent in suit in the following quotations:

Page 1, lines 28 to 35, "I provide a by-pass inserted into the penstock or flume at a point at or near the water-gate and a gate in the said by-pass controlled by the same governing mechanism that controls the water-gate and operating to allow a greater or less flow through the by-pass, according as the water-gate is being closed or opened." I have already in my answer to a previous question referred to the inverse relation of the terms "greater or less" and "closed or opened", and it is clear that the proper interpretation of this language implies the movement of the valve in either direction from this position.

Again, on page 4, lines 31 to 39: "Consequently the by-pass valve will be turned toward open or shut position, according to whether the gate is closing or opening, for the purpose above stated. Normally the gate or valve in the by-pass will be halfway open, so that the amount of water flowing through the by-pass and around the wheel without doing work will be half the amount which the by-pass is capable of carrying." Here again it is very plainly indicated that the normal position of the by-pass valve is half-way open and that, responsive to movement of the main water-gate, it will move inversely in either direction.

Again, on page 4, lines 74 to 84; "It is obvious that the by-pass, arranged as described, opening or

closing in a manner opposite to that in which the main gate opens or closes will, if properly adjusted, admit of the main gate being rapidly operated and the governing of the water-wheel quickly accomplished. After the governing takes place the by-pass gate is either open or closed, or nearly so, and in order to be useful for a second governing must return to its normal position." Here again the normal position is clearly indicated, and the movement in either direction therefrom.

Mr. Blakeslee: We move to strike out the answer on each of the grounds urged in the previous objections.

*adjournment heading & appearances omitted*

August 25th, 1915. P. M.

IT IS HEREBY STIPULATED and conceded by complainant on the record that the witness Lamar Lyndon who testified on behalf of complainant in this case was in error when he testified that no suit had been brought under the Lyndon patent in suit in this case; for, in fact, it is admitted that it has developed in taking further proofs in this case that a certain suit was brought under the patent in suit herein, and that the same was not prosecuted and that the same was dismissed upon stipulation between the parties without cost to either party after it had been pending a little over four years.

WILLIAM F. DURAND, recalled. Direct examination resumed.

By Mr. Westall:

Q. 20. By Mr. Westall: Do you find anywhere in the specification or drawings of the patent in suit any statement or suggestion that the by-pass valve may be adjusted to occupy any other than a half-open position as its normal position?

Mr. Blakeslee: Objected to on each of the leading grounds of objection heretofore registered, to the general effect that this is not proper rebuttal procedure, and that it is leading and not the proper method of proof. It is pointed out that this testimony can have nothing whatsoever to do with the discussion by the witness of the Lyndon Patent Model, as to which structure and its operativeness, within the provisions of the order in which these proceedings were to be conducted.

A. I do not, and for reasons which I believe are sufficiently developed in answer to the preceding questions.

Mr. Blakeslee: We move to strike out the answer and withhold it from consideration on each of the grounds of objection heretofore stated.

Q. 21. By Mr. Westall: Have you examined and do you understand the mechanism which I now point out to you and which has been indicated in this case as Complainant's Exhibit Operating Model of the Invention Disclosed by Complainant's Exhibit A, Copy of Lyndon Patent in Suit, and which, for convenient reference, we have been referring to as "Lyndon Patent Model"?

A. I have examined this mechanism and I believe that I understand the same.

Q. 22. Please state briefly your opinion as to the appropriateness of the descriptive title of this model.

Mr. Blakeslee: Objected to as irrelevant, immaterial and indefinite.

A. I understand that this question calls for an expression of opinion, or an analysis of the mechanism as compared with the construction as shown in the Lyndon specification, and on this understanding I proceed to develop such comparison, as follows:—

Q. 23. By Mr. Westall: I meant merely by the question to state briefly your conclusions as to whether or not the statement of the title that this is an operating model of the invention disclosed would be a proper designation of the model, without going fully into the reasons at this time.

Mr. Blakeslee: Objected to as calling for a sweeping conclusion on the part of the witness and not for a statement of facts, and not the proper method of proof, and immaterial.

A. The mechanism could not be considered as a proper operating model representing the disclosures of the Lyndon specification, without it contained all of the essential elements of operation which are implied in such specification. I find certain elements lacking in this model which are essential to the operation of a complete hydraulic power plant unit combined with a governing device such as is implied in the Lyndon specification. I therefore conclude that



the title is faulty in that it claims to fully represent the essential operative features of the Lyndon specification.

Q. 24. By Mr. Westall: Assuming that said Lyndon Patent Model has been introduced in evidence as correctly exemplifying the device of the patent in suit, and that witnesses who have preceded you have testified that it contains the elements of the Lyndon patent in suit or their mechanical equivalents, I will ask you to please state whether you agree with any such conclusion, stating fully your reasons for any opinion as to such identity or equivalence or lack thereof you may express.

Mr. Blakeslee: Objected to as calling for a sweeping conclusion on the part of the witness, not for a statement of facts tending one way or another to prove or disprove the contentions made by complainant with respect to this model, and not the proper method of proof.

A. I understand that this question calls for a general analysis of the Lyndon Patent Model in comparison with the disclosures of the Lyndon specification. With this understanding I proceed to develop such analysis as follows: Broadly speaking, the Lyndon Patent Model represents an apparatus in which an electric motor running at uniform speed as an external source of power serves to operate the parts which are intended to represent the main turbine or impulse wheels, together with such other parts as are mechanically connected thereto. Change of speed is brought about through direct human in-

tervention by means of a hand-wheel which causes the shifting of a so-called primary belt on certain cone pulleys on the back of the model. I note at this point that any speed of the model is a fixed or equilibrium speed so long as it is not disturbed by movement of the hand-wheel. This is due to the lack of any element in the model directly responsive to speed changes as such. Again, the movement of the hand-wheel by suitable connecting mechanical elements causes the movement of a bar which is intended to represent the solenoid core of the Lyndon specification. The movement of this bar then brings about certain electric contacts as a result of which certain magnets are energized and certain movements are initiated as the result of which the so-called secondary belt on the main pulleys is shifted in inverse manner and tends to return the speed towards the original value. Likewise, as an indication of movements in a hydraulic power unit, main or by-pass valves are by suitable mechanical connections caused to open or close in whole or in part according to the circumstances of the case, the opening or closing of such valves being intended to represent the control of the water to the wheel in an actual water-power unit.

Returning now to the Lyndon specification and description, the apparatus therein described is specifically intended to form the governing device of the water-power unit, consisting of a wheel with buckets or vanes suited to receive the action of the water and connected with the supply of water from which a

varying flow may be taken as required to overcome the resistance opposed to motion of the unit, which resistance varies according to an accidental and irregular program with a varying load. It is then the function of the governor to so adjust the flow of the water to the wheel under these conditions of irregularly varying load as to maintain a uniform or sensibly uniform speed. I note here that in the specification and description of the Lyndon patent it is the clearly specified purpose of this particular governing device to hold the wheel at a single unvarying or standard speed, no matter what may be the extent of the load change, or to return the wheel to such speed after any slight departure therefrom. Under these contemplated conditions the chain of governing operations implied in the Lyndon patent is briefly as follows: As a result of, for example, rejected load, the water supply to the wheel is in excess of the amount required to maintain the desired speed. And, in consequence, the latter begins to rise. This rise of speed is by mechanical elements communicated to an electric generator, which, in consequence, gives an increased voltage and an increased current flow through the circuits leading from the armature. As a result a certain solenoid is more strongly energized, thus giving a movement of the soft iron core inward. This movement by mechanical elements determines the making of certain electrical contacts as the result of which certain magnets are energized and the corresponding armatures are moved and certain clutches are thrown in and energy from the main

water-wheel shaft is put in play, and movements are thereby set up, leading ultimately to the return of the speed toward the standard value through the rejection of the water supply to the wheel. Such, I point out, is the obvious purpose contemplated in the Lyndon specification.

I now proceed to note certain points of difference between the Lyndon Patent Model and the device contemplated in the Lyndon specification.

First, and broadly, I cannot consider that any device involving as a direct and determining element the conscious and volitional agency of man can fairly and adequately represent the operation of a device dependent solely on inanimate and mechanical or electrical forces. In a sense the real governor in the case of the Lyndon Patent Model is the agency of the man who turns the handle, since this action not only changes the speed but also directly makes the electrical contacts which bring about a reverse or controlling operation.

Again, and broadly, the whole schedule of time and force relations in the two cases is fundamentally different. It is well known that the operation of a device depending solely on mechanical or electrical forces is in very large measure determined by the inter-play of these forces in their various time relations. Especially is this true in the case of so sensitive a device as a water wheel governor. In advance, therefore, of detailed analysis of this point, I state broadly that in my opinion the behavior of an automatic and self-contained mechanism such as a



water-wheel governor, and actuated solely by inanimate mechanical and electrical forces, cannot safely be foretold by any device in which human agency or volition takes the place of essential elements of an automatic device. I proceed to certain points of detail in regard to these matters. The first and determining movement in the case contemplated by the Lyndon patent is a change of speed of the main shaft followed in series by a change of speed in the generator, a change in the energization of the solenoid and a resultant movement of the solenoid core. The corresponding movement in the model is the turning of a hand-wheel by human agency, as the result of which two movements result simultaneously. First, a change in speed of the wheels, and, second, the movement of the bar intended to represent the solenoid core. The time and force relations of the movements in the two cases are different, for the reason that in the Lyndon specification they occur in series, and, second, as the direct result of the first; while in the Lyndon Patent Model they occur together and both as the result of a common cause. Likewise, in the Lyndon Patent Model the connection is mechanical and positive, and the movement of the bar which represents the solenoid core follows directly in step with the movement of the hand-wheel. In the Lyndon specification the connection is electromagnetic, and the movement of the solenoid core bears no such simple or direct relation to the change of speed. I will develop the latter point in further detail. The increase in speed of dynamo 8 will be followed with



no sensible delay or time lag by the increase in voltage and current delivered. There is, however, a time lag in building up the magnetic field produced by the solenoid, and in producing a beginning of motion of the core 34. There will be a combination of inertia, stiffness of joints, and friction, which must be overcome before the core will begin to move. Furthermore, the force available to overcome this initial resistance is not the entire pull of the solenoid, but only the excess or difference of pull due to what may be called the difference in the solenoid field. In other words, for every degree of energization of the solenoid coil there is a particular position which the core will take against the opposing forces. If, then, the core occupies a certain position while the degree of energization begins to build up, the unbalanced force or the force tending to move the core with reference to these resistances of inertia, stiffness of joints, friction, and spring resistance, is that due to the difference between the two degrees of energization. Generally speaking, the degree of energization of a coil will reach its higher value quickly and in advance of the movement of the core. The core will then follow along and will gradually assume its new position of equilibrium. I use the word "gradually" advisedly, because while the entire operation is quickly performed, as judged by our ordinary senses, the movement itself is, nevertheless, gradual, and involves a start from rest, an attainment of full speed, and a gradual slowing down to rest in a new position. The gradual slowing down is due to the same general

facts noted above in connection with the starting up. As the core approaches its final position it is acted on by a continuously decreasing unbalanced force due to the continually decreasing difference between the degree of energization which the coil actually has and that corresponding to the momentary location of the core. Due to these relations the core will be continuously moved under an unbalanced force gradually decreasing to zero, and will in consequence gradually come to rest. I find in these characteristics and force relation in the two cases, essential, and, I believe, material differences.

I pass next to the immediate results of this movement. In both cases these are the making of certain electric contacts, and the Lyndon Patent Model realizes the general purpose disclosed by the Lyndon specification, so far as regards the making of an electric contact as such. I note, however, that the time relation of these contacts is not directly stated in the Lyndon specification and can only be inferred by a reading of the stated results. In the Lyndon Patent Model a make-and-break in series seems to be contemplated, though with a different adjustment the contacts could be made simultaneously if desired. I note, however, in passing, that in one important particular the Lyndon Patent Model does not represent the conditions of the Lyndon specification, and particularly the serial progress of the contacts as contemplated. In an actual hydraulic power plant governor as contemplated in the Lyndon specification, the progress of these contacts is entirely re-

moved from human intervention and will depend on the way in which they are adjusted and the character of the load change. In the Lyndon Patent Model they are under the control of the operator and the time interval between such contacts may be varied at will in accordance with the mode of turning the hand-wheel. In this matter of contacts, however, I follow the reading of the mode of operation as given in the Lyndon patent on page 3, line 71, and following.

The series of events leading to the closing of the main water-gate is then as follows: Extra energizing of solenoid 33, movement of core 34, making of contacts 40, 40a, energizing of clutch magnet 15, and for convenience I refer to the one magnet, but it will be understood that the reverse magnet 16 may also be understood as coming into operation in the reverse case—movement of armature 17, throwing in of clutch 13 and, through the gear connections shown, the ultimate movement of the water-wheel gate. In the Lyndon Patent Model essentially equivalent means are provided for the train of events lying between and including the making of the contacts 40 40a and the throwing in of the clutch 13.

I have already spoken of what precedes the making of the contacts. Taking up what now follows the throwing in of clutch 13, we have in the Lyndon specification the chain of events as noted above which leads to the movement of the wheel gate. In the Lyndon Model, however, we have a chain of events leading by positive mechanical connections, to the

shifting of a so-called secondary belt, and to a consequent change in the speed of the wheel. The distinction is one of importance. In the Lyndon specification the immediate end and purpose of the movements is the closing or partial closing of a gate. This reduces the supply of water—that is, energy—to the wheel, but leaves the question of speed and its final return to normal value to be determined by the interplay of the supply of energy to the wheel, the inertia of the moving parts of the wheel and attached driven units, the resistance opposed to the wheel, friction, electromagnetic inter-action between the generator and line (in case of an electric generator) and all other forces or agencies which may be involved. In the case of the Lyndon Patent Model, the control of speed, that is the end which is sought, is positively and directly produced by the mechanical connections involved, and which are initiated by human agency, a condition which cannot possibly represent the complicated inter-play of determining agencies in the case of an actual hydraulic power plant unit.

I also note at this point a further divergence between the Lyndon Patent Model and the Lyndon specification in the matter of the return of the armature core 34 or its representative bar to normal or neutral position. In the Lyndon specification this return follows as the result of the return of the speed of the dynamo 8 and hence of the water-wheel unit, to normal value. That is, the return is responsive directly to the speed of the unit and follows as a consequence thereof. In the Lyndon Patent Model



the return follows the movement of the secondary belt; and while it accompanies the return of the speed to normal value, both being a consequence of the shifting belt, the return of the bar is in no sense a result of the changing speed. Here again it is a case in the Lyndon specification of two actions following one the other in direct causal relation, and in the Lyndon Patent Model of two actions produced simultaneously, both as the result of an external agency.

On these points, therefore, I conclude that the Lyndon Patent Model fails to properly represent the conditions directly affecting the control of speed which are obviously contemplated in the Lyndon specification.

Passing now to the so-called returning device referred to in the Lyndon patent on page 3, line 116, and following, the stated chain of events is as follows:

The setting of shaft 12 in motion, the operation of rod 36 to move lever 43, the closure of circuit 102, the energization of magnet 32, the engagement of discs 25 22, the resultant movement of rod 25, the movement of the lever 26 and the rupture of the contacts 40 40a, 45a, 45, 46a 46, thus de-energizing the magnets 15 (or 16) and 32, arresting the gate movement and allowing bar 25 to return to whatever position it may take by reason of its connection with the solenoid core 34.

We find here an indication of the purposes which the inventor had in mind with regard to the time relation of these contacts. The Lyndon specification



states on page 3, line 129, "when the governor shaft 12 is set in operation . . . . the rod 36 operates the lever 43 to close" etc. There is, however, no causal relation between shaft 12 and link 36, as a result of which the movement of 12 could cause 36 to move and operate the lever 43. The link 36 is simply an extension of the solenoid core and moves directly with it, and I can only conclude that when the Lyndon specification says "when the governor shaft 12," etc. he means "at the same instant as." I therefore conclude that the inventor contemplated simultaneous closures of the two circuits, 106 and 102, or substantially simultaneous, or, in any event, that 102 is closed the instant shaft 12, and hence, the gate shaft, begins to move.

With regard to the model, the arrangement of mercury cups, and so forth, seems to permit of any desired adjustment of these time relations, and, assuming that the complainant desires to realize simultaneous contacts for these circuits, in accordance with the obvious intent of the Lyndon specification, the arrangement shown by the Lyndon Patent Model seems adequately suited to this purpose.

I note at this point that this correspondence between the Lyndon Patent Model and the Lyndon specification is independent of the question of whether either would satisfactorily attain the end in view, namely, the avoidance of over-run in effecting a change of speed. I am now solely concerned with points of similarity or divergence between the Lyndon Patent Model and the construction contemplated in the Lyndon specifications.

Turning now to the returning elements and connected parts, I find substantially similar construction in the Lyndon Patent Model as contemplated by the Lyndon patent specifications. This, again, is independent of the question of their operation for the purposes intended.

I pass now to the question of the operation of the by-pass valve. The sequence of events here described is indicated in the Lyndon specification, at page 4, line 16, and the order of events is as follows: The movement of lever 43, the closure of contacts 45a 46a 100 101, the energizing of circuit 105 and magnet 64, the movement of 63, the engagement of clutch 58 and the operation of the by-pass through the drum 54 and the ropes 51 52. Here again, from the use in the Lyndon specification of the words "when the gate is operated" etc., line 16, page 4, and also the coupling together in the line 18 of the two sets of contacts 45a 46a 100 101, it is clear that contact 100 101 is intended to be made simultaneously with 45a 46a, and with 40. The simultaneous operation of the by-pass and main gate valve is also clearly indicated in the Lyndon <sup>specification</sup> description of general purpose, as noted in a previous answer.

As already noted, the Lyndon Patent Model permits of the simultaneous making of all these contacts and, therefore, fulfills the obvious purpose of the Lyndon specification.

Furthermore, in the Lyndon Patent Model the constructions relating to the remaining features of the by-pass, so far as primary movement is concerned,

adequately represents the elements contemplated in the Lyndon specification. The Lyndon Patent Model does, however show two other forms of by-pass arrangement not directly referred to or shown in the Lyndon patent.

I come now to the return for the by-pass valve. The sequence of events contemplated in the Lyndon specification is as follows: the return of controller 26 to normal position, breaking circuit 105, de-energizing magnet 64, followed by disengagement of clutch 58 and slow return of the by-pass gate to normal position, which is half open. In the Lyndon Patent Model the means employed for return, while different in character, realize substantially the same results and may, therefore, be taken as a satisfactory representation of the Lyndon specification. I note also a difference between the Lyndon specification and drawings and the Lyndon Patent Model in the arrangement of certain contacts bringing into operation the limit device to break the circuit at the extreme throw of the by-pass. This difference in arrangement, however, has no important bearing on the question of function.

I note further in the Lyndon Patent Model an additional feature of certain red and green lights. These are in addition to the features previously mentioned, which have no direct analogy in the Lyndon specification. These lights are presumably intended to indicate when the speed is too high and when too low. In connection with these lights it should be noted that they are in no wise directly responsive to speed,

but only to the making or breaking of contacts 40 and 41, which latter are made by a movement of the hand-wheel through human agency, or broken as the result of the so-called core bar. The point here is that the lights are not responsive to speed as such, but rather to agencies which in the Lyndon Patent Model have the speed under control.

As a summing up of this comparison of the Lyndon specification and the Lyndon Patent Model and as an over-all characterization, I do not consider where the demonstration of the operative practicability or effectiveness of a device such as a water-wheel governor attached to a water-power unit and operating under variable load, that any device or model can be accepted as conclusive which omits any of the essential elements or force relations which such a water-power unit and governor embody. In other words, I do not consider that anything short of an actual water-power unit and governor connected to an accidentally varying load could be considered as conclusive with regard to the minute operative features or as to the practicability of a device such as that indicated in the Lyndon specification. An actual power plant operating under varying load and under satisfactory control by such a device would serve as conclusive evidence, and I should be entirely unwilling to accept anything else.

Q. 25. By Mr. Westall: Do you find in such Lyndon Patent Model any equivalent for the dynamo 8 of the Lyndon patent in suit?

Mr. Blakeslee: Objected to as calling for a conclu-



sion on the part of the witness and not for a statement of facts and comparison, and as leading and suggestive and not the proper method of proof.

A. I don't find any such equivalent as I have already stated in my previous answer.

Q. 26. By Mr. Westall: Do you find in such Lyndon Patent Model any device or element performing substantially the same function in substantially the same way as the element referred to in the Lyndon patent as dynamo 8?

Mr. Blakeslee: The same objection.

A. The function of dynamo 8 in the Lyndon specification is to provide an element responsive to varying speed in a power plant prime mover and to initiate movements which will result in a correction and return of such speed to normal value. I find in the Lyndon Patent Model no such element performing analogous functions in any similar or equivalent manner.

Q. 27. By Mr. Westall: Do you find in such Lyndon Patent Model any equivalent, by which I mean an element performing substantially the same function in substantially the same way, of the solenoid 33 of the Lyndon patent in suit.

Mr. Blakeslee: The same objection.

A. The function of the solenoid 33 in the Lyndon specification is to furnish an element immediately responsive to changes of speed in the dynamo, itself initiating by electromagnetic means the train of operations resulting in the correction of the speed and its return to normal value. There is in the



Lyndon Patent Model no such element performing any such function in a similar or equivalent manner.

Q. 28. By Mr. Westall: What are the fundamental characteristics of a hydraulic power plant with especial reference to the problem of governing?

Mr. Blakeslee: Objected to as not within the order permitting surrebuttal in this case, having nothing to do whatsoever with the structure or operation of the Lyndon Patent Model as such and as it is before us for discussion.

Mr. Westall: The question is merely to lay the foundation for the future comparison of the Lyndon patent with the model.

Mr. Blakeslee: The only foundation for such a comparison possible is the study of the model itself and its direct comparison with the parts shown in the drawings and defined in the specification of the Lyndon patent.

A. I should broadly classify such features under two heads: a power unit responsive in speed to changes of load with the intricate time and force relations involved. Second, a speed-sensitive element, the movement of which initiates a chain of events as a consequence of which the water-gate is moved and the speed settles to a uniform value under the new load. Both of these elements and all of these conditions are plainly contemplated in the Lyndon specifications.

Q. 29. By Mr. Westall: Do you find either of

these elements in the Lyndon Patent Model?

A. I do not, as I have fully explained in my general analysis and comparison of the Lyndon Patent Model with the Lyndon specification.

Q. 30. Please compare in resume the Lyndon Patent Model with the device contemplated in the Lyndon specification, noting each of the points of divergence.

A. I would note such resume of comparison and points of divergence under the following heads: First, the fundamental features of the water-power plant and governor as contemplated by the Lyndon specification are referred to in answer to the preceding question. Neither of these is found on the Lyndon Patent Model. Second, the operation of the device contemplated in the Lyndon patent specification involves no human agency. The model involves the agency of man as a determining element. Third, the schedule of time and force relations is fundamentally different in the Lyndon Patent Model and in the device contemplated in the Lyndon specification. Fourth, in the Lyndon specification the load change, the speed change and the corrective movement proceed serially and in direct causal relation, one following the other. In the model the movement of the hand-wheel results simultaneously in a change of speed and in the necessary corrective movements, both being common results from the same cause. Fifth, in the Lyndon specifications the closure of the gate leaves the speed to adjust itself under the existing force and time conditions. In the

Lyndon Patent Model the shifting of the belt directly compels a change in the speed. Sixth, in the Lyndon specification serial contacts, if contemplated, are not under human control. In the model, serial contacts, if employed, are under human control. Seventh, in the Lyndon specification the return of the solenoid core results as a consequence of the return of speed to the standard value. In the Lyndon Model the return of the bar corresponding to the solenoid core results as a consequence of the movement of a secondary belt shift.

Q. 31. Would a device containing the general operative features of the Lyndon Patent Model, to which you have referred, constitute an effective and satisfactory governor for hydraulic power plant purposes.

Mr. Blakeslee: Objected to as calling for a sweeping conclusion and not for a statement of facts.

A. By "operative features" I must here assume that you mean those parts which relate solely to the operation of governing or controlling under usual power-plant conditions. We must, therefore, omit all features which for demonstration purposes the usual conditions of a water-power plant are plainly departed from. This will remove the following items: The belts and cone pulleys for changing the speed at will, the hand-wheel for volitionally controlling the bar representing the solenoid core. If we may assume a hydraulic power unit under varying load substituted for the first of these omissions and a bar whose movements are responsive to speed

change for the second, such, for example, as the core 34 with electric generator and connection as shown in the Lyndon specification, then a judgment may be reached regarding the practicability of the features as a water-wheel governor. With this understanding I reply that in my opinion such a device would not be practicable or satisfactory for purposes of governing a hydraulic power unit. I reach such a conclusion by an analysis of the operative features in relation to the purposes required. This analysis I take up as follows: The belt-driven generator with connections together with the solenoid and core, while scarcely ideal in the light of past experience in water-wheel governors, might possibly be made to function satisfactorily as a speed-responsive element. Here, in passing, however, it may be noted that the movement of the solenoid core available to correct any small change of speed, such as two or three or even five per cent, will be very small, indeed, and this would greatly magnify the difficulties in connection with the multiplying levers 26 and 43, and would tend to give relatively minute forces available at the contact points, and would require especially delicate adjustment of the contact distances in order to render the remaining elements of the combination responsive to these minute movements of the core 34. I next refer to the use of electric contacts as a determining element in the device. These contacts, from the small forces available, are intended to be of the end or touch-contact type or of the mercury cup type. Contacts of the end or



touch type would be exceedingly difficult to place a magnet in proper adjustment without an elastic element. There must be some spring or yield in one element or other of the contact, and the time of remaining in contact and of make and of break will depend primarily on an accurate and careful adjustment of the two parts of the contact. Now, with magnets capable of producing the results required in the governing of a water-power unit of any considerable size, especially such as would be significant of present day practice, the current strength would be such as to result in a very considerable sparking on breaking the circuit. This would result in deforming the contact surfaces and in quickly disturbing the time relations necessary for the proper operation of the device. The same general objection in my opinion holds in regard to mercury contacts. In this case the mercury is employed in order to provide a yielding contact with a minimum of resistance at the contact point. This is the type of contact exhibited in the Lyndon Patent Model. In this case under operation with the surface of the mercury exposed to the air and under the sparking influence referred to above, the surface of the mercury will quickly become clogged with a spongy form of mercuric oxide, obscuring and interfering with the nature of the contact and disturbing the time relations required for proper operation. It may be noted that to avoid these difficulties the surface of the mercury is sometimes covered with oil so as to protect it from the air. In this case, however, one



difficulty is avoided at the expense of another. The oil under the influence of the sparking is likely to become transformed into a sort of heavy mercury emulsion, again deranging the proper operation and disturbing the time relations involved.

I next pass to the question of these time relations of contacts, assuming that they may, for a short time, be made effectively operative. The Lyndon specification clearly contemplates the simultaneous making and breaking of these various contacts. The Lyndon Patent Model clearly admits of so adjusting the contacts as to make them simultaneous. On this assumption it is clear that the instant clutch 13 is engaged and the wheel-gate begins to move, at that instant also will clutch 58 be engaged and the by-pass will begin to move, while at the same time clutch 22 23 will be engaged and the contacts will as an incident thereof all be broken and all action stopped. Practically, then, the wheel-gate and by-pass would just stop to move and would then stop due to this disengagement. The by-pass will then begin to return and the wheel-gate will have made merely a beginning of its necessary movement. In the meantime, the solenoid and core are again out of equilibrium as there will have been as yet scarcely a perceptible change in the speed of the dynamo 8. In consequence, the operation begins over again. The core is drawn in, contacts are made, a beginning of gate movement is made, to be again interrupted by disengagement. It is conceivable that after a sufficient length of time, as the result of these spas-

modic and interrupted movements, the gate might be moved to its new position for the new load, and equilibrium again established. It is very sure, however, that this would not prove a satisfactory or acceptable mode of governing, especially in the case of rapidly changing loads, nor could it in any way be considered as an advance in the art. It would constitute rather a reversal to the older types of governors whereby the gates were moved by double ratchet and pawl combinations, and to which the spasmodic or intermittent action above described is in general analogous.

I refer again to the question of the time interval which may elapse between the beginning of motion of shaft 12 and the arrest of such motion by the breaking of contact 30 or 31. We must assume that with the simultaneous making of all contacts magnet 32 is energized as soon as 15 and hence that clutch 22 23 is engaged as soon as shaft 12 begins to turn. The question then devolves on how long or how far 25 will move before it pushes controller 26 with sufficient force to break the contacts. This will depend primarily on the force which it must overcome at the solenoid, and the distance of movement of either elastic or mercury contacts. The controller 26 is immediately acted on through the springs 27 28 at elastic joints. And in pushing 26 so as to break contact 40, for example, the first result will be a gradual compression and accumulation of pressure in the spring 27, corresponding to the gradual increase of resistance to movement, which will be

exhibited by solenoid core 34 until finally a sufficient movement has been developed to carry the contact points out of contact, when all magnetic energization and clutch operation ceases and the core 34 is again free to take up whatever position may be required by the magnetic field in the solenoid. The inertia of the moving parts, including the returning bar 25 and all directly attached parts, due to their velocity at the instant of this engagement of clutch 22 23 will tend to cause an over-travel of controller bar 26, and with very close adjustment this might conceivably result in a momentary contact at the wrong end of controller bar 26, thus introducing another disturbing element. I point out specifically that on the supposition of simultaneous magnet energization the period of time between or during which the gate-shaft 21b will be in actual movement in the case of a given single push or impulsive movement, will thus be determined by the tension of the spring 27 or 28, the magnetic forces in the solenoid 33, and the actual adjustment of contact parts as, for example, tin and mercury.

Turning now in the light of these considerations to the question of overrunning and of means for preventing, I do not find in the above stated items for determining the period of operation any natural or responsive relation to the extent of operation required in order to move the gate from the equilibrium position for the old load to that for the new load and no more. In fact, it is very sure that under conditions as contemplated the time of action would

be exceedingly brief. There would be no more than a beginning of movement of the gate-shaft 21b before arrest by the breaking of the circuit and the approach to the final steady condition would be by the ratchet or step-wise movement previously referred to, and unsuited to modern power plant conditions, and demands and apparently foreign to the mode of operation intended in the Lyndon specification.

Especial stress is laid in the Lyndon specification on the function of the returning device as a means of preventing overrun or hunting. It should be noted that the fundamental conditions which must be fulfilled in order to realize this end, are the following three:

First, the load changes.

Second, to this changed load there will correspond a certain gate-opening which will deliver water energy just sufficient to maintain the wheel at stand-ard speed or at a speed which will place the speed-sensitive device of the governor in a neutral position with reference to all governor movements.

Third, then, as the wheel-gate gradually moves, as for example in closing, it must, when reaching the gate condition noted in number two, find the wheel moving at the corresponding speed and without acceleration or retardation, and the speed-sensitive element in a neutral or non-operative position.

These particular conditions noted in number three must occur simultaneously. Under these conditions, and none other, the wheel will continue on steadily



and without further change of speed. It may be here noted also that in the Lyndon Patent Model and in the Lyndon specification the final speed is always fixed and uniform and does not vary with the load, while with many other forms of governors the steady speed control changes with the load over a definite but narrow range of, for example, 2 per cent or more, in some cases. A load change, furthermore, may vary in extent and in rapidity and in any combination of the two, as, for example, slow and slight, or slow and large, or fast and slight, or fast and large, and all in varying degrees. I am unable to find on the Lyndon Patent Model or in the Lyndon specifications any means for a time of action of the wheel gate or a degree of action of the wheel gate responsive to these varying modes of load changes, or any features which will insure, at the particular instant when the proper gate-opening has been reached, that the prime mover will be moving at the normal speed without acceleration or retardation and that the bar 26 and solenoid core will be in neutral position and inoperative.

I therefore conclude that under actual conditions of operation the device would not be adequate to prevent over-run in the sense contemplated in the Lyndon specification or in any sense satisfactory for modern hydraulic power plant requirements.

The preceding discussion regarding the timing of the movements of the wheel gate, regarding the responsive or intermittent character of this movement, and regarding the general operativeness of the



device to control the speed without overrun, has been based on the assumption of simultaneous energization of all magnets, as plainly contemplated in the Lyndon specification. With reference to the claims or suggestions that energization in series is intended or would serve to render the device properly operative, I note as follows:

We may apparently consider three possible cases:

1. Energization of magnet 15 first followed by energization of 32 and 64 simultaneously.
2. Energization of magnet 15 first followed in series by 64 and then 32.
3. Energization of magnet 15 first followed in series by 32 and then 64.

It must be noted that in all of these cases the order of breaking the circuits will be the inverse of the order of making them.

Turning first to case 1, the result briefly will be as follows: The gate-shaft 21b will begin to turn, say, closing the gate. The by-pass in the meantime will be inoperative. If the total change of load is very slight or very slow there may be no further contacts made and the by-pass and returning rod may not be called into play, leaving the final adjustment to be made by the main gate alone and the break of contact 40 to be effected by the ultimate return of the coil 34 to normal position. If, however, the change in the load is greater in amount or more rapid in character than can be accommodated by such program, the contacts energizing 32 and 64 will be made after a very short interval of time for the

movement of the main gate-shaft. In any practicable device this period of time will be exceedingly short, since in the movement of the core 34 and attached parts the actual time interval between the making of, say, contact 40 and contacts 45 100 can at the most be only a small fraction of a second. After this brief interval the by-pass and returning device will then become operative simultaneously, ~~resulting in the immediate deenergization of magnets~~ resulting in the immediate de-energization of magnets 32 and 64 and the arrest of rod 25 presumably before contact 40 is broken. The result will be a spasmodic kick on the part of the by-pass followed by return to normal half-open position. In the meantime clutch magnets 15 or 16 are still operative and the wheel-gate is still moving and producing this effect on the speed of the unit. The next stage will depend on the relation of the condition of the solenoid and core as determined by the speed of the wheel. If there is still a sufficient excess pull on the core, reclosure of circuits 102 and 105 may result with another slight movement of the by-pass. If there is not sufficient pull on the core 34 to make such contacts, then contact 40 will persist and the wheel gate will be gradually turned till the speed is modified and brought back ultimately to standard value when the core will return to its normal position, thus breaking contact 40. The general result is, therefor, governing without effective operation of either by-pass or returning device, and with no natural relation between the parts in such manner as

to prevent over-run. In point of fact, the device in this form would be quite similar to the operation of certain older forms of water-wheel governors without compensation or return device, and in which over-run is likely to occur due to the effects of inertia and time-lag in finally breaking the contact 46. This arrangement would therefore in no essential manner seem likely to improve the operation of the device.

I come next to case 2, the energization of 15 (or 16) 32 and 64 in series. It is readily seen that this case would be very difficult to realize since the energization of 32 would serve to throw back the controller 26 and prevent the making of 64. It will therefore result substantially in the operation of case number one with the omission of the by-pass. This case is, therefore, clearly subversive of the entire theory of governing as proposed by the Lyndon patent, and it would have all the defects of the previous case.

Turning next to case number three, with magnets 15 (or 16) 64 and 32 brought serially into operation, we shall have a beginning of motion of both wheel-gate and by-pass followed by movement of returning rod 25 and de-energization of magnet 32. The inertia of the parts may or may not break the contacts of 64 and 15. If they are not broken the gate and by-pass will go on operating virtually uninfluenced by the returning rod. If they are broken, the whole operation will begin over again, and go on spasmodically. Again, in the case where the con-

tacts are not broken, the returning rod circuit may remain de-energized, due to failure of this contact to be re-made, or again, it may be re-energized with a like unbreaking, but with no other result. In general, then, the operation in this case is either spasmodic and step-wise for both main gate and bypass, or it is continuous for both, without effect or influence of any return or compensating device. In no case does it appear that the results would be satisfactory for the governing of a hydraulic power plant prime mover.

In this matter generally and the operation of the returning bar and the time relation of the various electric contacts, I point out that in every case and no matter what may be the details of adjustment, the energization of magnets 15 and 64 are separated by a certain time interval. This time interval is in no wise responsive to the nature or extent of the load change, and hence it cannot properly function to prevent overrun in the actual case of a power plant operating under irregularly varying load. In particular, if the load change is very sudden and large, requiring a very considerable gate movement for control, the movement of the solenoid core will be correspondingly sharp and extreme, and the time interval correspondingly reduced. In such case the characteristics of spasmodic action would therefore be present in a marked degree.

In this connection there is a defect in the Lyndon Patent Model as a representation of the operation of an actual governor under power plant conditions.



This lies in the fact that in an actual governor constructed according to the Lyndon specifications the making of the contacts which serve to energize the magnets 15, 32 and 64, proceed in such order as the adjustments may determine, either simultaneously or serially, and with such time interval as may be determined by the adjustments themselves, and by the various forces involved and by the character of the load change; but in all cases absolutely beyond the control of human agency.

In the Lyndon Patent Model these contacts are effected by turning the hand-wheel, and if arranged for serial contact it follows that the wheel may be turned just far enough or fast enough to energize magnet 15, for example, and then, after any time interval, at the will of the operator, it may be turned further or more rapidly so as to energize magnet 64 or 32 or both. In particular it thus appears that in the Lyndon Patent Model the time interval between the energization of magnets 15 and 64, and hence the time interval between the beginning of gate-shaft movement and the operation of the returning device, may be varied at the will of the person.

By these means results might be made to appear which would not be possible under the construction following the Lyndon specification and applied to an actual power plant operating under usual conditions. The model therefore contains an element and a mode of operation foreign to the design of the Lyndon specification or to any design which could be applied



to the regulation of a hydraulic power plant.

Mr. Blakeslee: We move to strike the entire previous answer of the witness from the record on the ground that it lies entirely without the limits imposed by the order permitting the taking of surrebuttal testimony in this case, being apparently a theoretical thesis upon the Lyndon patent in suit, read by the witness from notes, and not being an answer predicated upon a construction of the Lyndon Patent Model as such and its attributes of operative-ness. This is not the time at which defendant can patch up its case with respect to the disclosures of the Lyndon patent as such. These matters have been gone into fully by a number of witnesses for the defendant within the proper time for taking its proofs, and this procedure has well defined limits which have been previously stated in these proceedings.

Q. 32. By Mr. Westall: Have you read the testimony of Mr. S. L. Berry concerning the operativeness of the device of the Lyndon patent in suit?

Mr. Blakeslee: The same objection, and irrelevant and not proper surrebuttal.

A. I have.

Q. 33. By Mr. Westall: Please state whether or not you agree with the conclusions and reasons therefor as to the operativeness of the device of the Lyndon patent in suit as expressed in the testimony of Mr. S. L. Perry, to which you have referred.

Mr. Blakeslee: Objected to on the ground that it is not the proper method of proof, and upon each

of the grounds urged in the objection to the last question, and as calling for a sweeping conclusion and not for a statement of facts, and not the proper way to corroborate or attempt to corroborate the testimony of another witness.

A. I agree in general with all the main conclusions of Mr. Berry with reference to the operativeness of the device as discussed by him, and with his reasons for the same, as may furthermore be clearly deduced from my answer to question No.

Q. 34. By Mr. Westall: Referring again to Complainant's Exhibit Patent Model, please state whether or not said model answers the objections of the said witness S. L. Berry as to the operative-ness of the device of the Lyndon patent in suit.

Mr. Blakeslee: Objected to as not proper surrebuttal, on the grounds heretofore urged, not calling for a statement of facts but merely for a sweeping conclusion on the part of the witness. Furthermore, it is not calling for the best evidence, the witness not having qualified to testify in propria persona for Mr. S. L. Berry.

A. In my opinion the Lyndon Patent Model does not meet the objections urged by Mr. Berry, for the primary reasons that the operative features, to which Mr. Berry especially refers, are included in the model, and their general mode of operation as contemplated by the Lyndon specification is equivalent or closely similar to the mode of operation of the analogous device shown on the Lyndon Patent Model. It follows therefore that with special reference to the ob-

jections of Mr. Berry the operation of the Lyndon Patent Model would apparently follow closely in these respects the operation of the device contemplated in such specification, and would therefore be subject to the same general objections.

Q. 35. By Mr. Westall: State in resume your reasons for considering Complainant's Exhibit Lyndon Patent Model, as represented in the Lyndon specifications, impracticable as a water-wheel governor.

Mr. Blakeslee: Objected to as calling for sweeping conclusion and not for a statement of facts; and furthermore, as not surrebuttal, the proper procedure being to discuss the action of this model device as such.

A. In resume I mention the following points covered in greater detail in my answer to question No.

First, the small movement of the solenoid core and the relatively small forces available at the contact points.

Second, the extreme delicacy of the adjustments required.

Third, the use of electric contacts with the resultant sparking and disturbance of adjustments.

Fourth. Assuming simultaneous contacts, an action spasmodic and irregular in character and extent to the requirements of hydraulic power-plant governing.

Fifth. No natural or responsive relation between the time interval of the movement of the main wheel-gate and the operation of the return bar, with refer-

cnce to the relation of such action to the character and extent of the load change.

Sixth. With serial contacts, failure to improve the character of the operation in any essential particular.

Mr. Blakeslee: We move to strike out the entire answer on each of the grounds of the objections urged to the question.

Mr. Westall: Counsel for complainant may inquire.

Mr. Blakeslee: We move to strike out and suppress the entire deposition of the present witness on his direct examination on the several grounds of objection urged to the questions and particularly on the general ground that the deposition of the witness as a whole is not within the order of the Court permitting surrebuttal procedure.

And without waiving any of the objections of record and, in effect, relying upon such objection to be passed upon by the Court at the final hearing of this case, the complainant will proceed to cross-examine the present witness.

### CROSS-EXAMINATION

By Mr. Blakeslee:

XQ. 36. Have you ever operated or attempted to operate the Lyndon Patent Model yourself?

A. On Friday, August 20, and Saturday, August 21, I made a careful examination of the Lyndon Patent Model and operated such features of the model as I found possible in the absence of a storage

battery furnishing electric energy for energizing the various magnets. I, however, satisfied myself to the operative nature and character of the various features of the model and felt satisfied that I understood the general character of operation contemplated by such model.

XQ. 37. In other words, there is nothing obscure with respect to this model, is there, as to the specific action of the one solenoid it contains, and the three electromagnets it contains, corresponding to the one solenoid and the three electromagnets of the Lyndon patent?

A. I did not find an solenoid in the Lyndon Patent Model.

XQ. 38. Yes. You are correct. I do not contend that there is a solenoid in this model. My eye was on the patent. With respect to the four electromagnets, two of which are included in one set, for actuating the clutch which sets into operation the shaft for turning the water-wheel gates, there is no obscurity in the model with respect to the action of such electromagnets?

A. I did not observe any.

XQ. 39. And it is a matter of common knowledge how such electromagnets would work, and that is also true of the counter-part electromagnets disclosed in the Lyndon patent?

A. It is.

XQ. 40. You did not energize any of these electromagnets in your study of this Lyndon Patent Model, did you?



A. I found it impossible to do so by reason of the absence of any storage battery or other source of electrical energy to effect such energization.

XQ. 41. Would not such source of electrical energy have been easily procured at that time?

A. I presume it could have been procured if it had seemed necessary to carry the examination to that point.

XQ. 42. Then we are to understand, are we, that your testimony is based upon a mere inspection of the Lyndon Patent Model the same as you would inspect a drawing or inspect a machine at rest, and is not based upon inspection or study of the model with the parts in play. Is that correct?

A. My investigation of the model involved the operation of the main drive-shaft and all parts connected thereto. In short, with everything directly connected with the electric motor which is provided. The parts which were inoperative were the various electromagnets, for reasons which I have already stated. My investigation of the model, however, is further based on my reading of the testimony of Mr. George J. Henry, referring to and describing the operation of such model, and I satisfied myself as to the proper general co-relation between the particular movements described by Mr. Henry and the means on the model for producing such movements.

XQ. 43. You did not find any reason in your inspection of the Lyndon Patent Model to disagree with the testimony of Mr. Henry, to which you have referred, with respect to the actual operation of the model, did you?

A. I did not as to the specific statements made with reference to the various moving parts and their functions and direct movements.

XQ. 44. In other words, where Mr. Henry set forth or stated that resultant upon such-and-such a causation such-and-such an action followed, you found no reason to disagree with him, did you?

A. I found reason to disagree with Mr. Henry in certain of the conclusions which he drew in reference to the interpretation of the operation of the model in terms of a water-wheel governor, but not with reference to the direct statements of Mr. Henry with reference to the movements of the model itself.

XQ. 45. And you were not able in your inspection of the Lyndon Patent Model to study the mechanical effects produced upon the energization of the several electromagnets contained in that model, were you? .

A. I satisfied myself fully as to the operative possibility of all such magnets and I personally moved every operative part by finger or hand, making and breaking the contacts by hand, throwing the clutches in and out of engagement, and assuring myself generally of the operative possibility of the model in the general sense described by Mr. Henry.

XQ. 46. Then you got the same kind of results predicated upon voluntary hand or manual actuation that you have treated of in your discussion of this Lyndon Patent Model as being a hand-operated model, did you not?

A. I obtained each individual movement separately and satisfied myself as to its nature and character, but I could not obtain the various movements simultaneously in the same order in which they might have been obtained had there been present a source of electrical energy.

XQ. 47. And you were not able to get the same co-relation of movements and sequences of movements that you could have obtained had the electromagnets been energized, were you?

A. I satisfied myself fully, as I have previously stated, that all of these movements were provided for by the mechanism of the model and in the sense as described by Mr. Henry in his discussion and description of the operation of said model. I may further state that there are certain movements and operations so simple in character that it hardly seems necessary to lay particular stress on the actual operation. For example, if one familiar with mechanical devices sees a lever he does not need to actually operate the lever in order to satisfy himself of the sequences of such operation. It is a matter of life-long acquaintance with him and he instinctively and naturally deduces the result of such movements in any such cases.

Mr. Westall: I should like to interrupt long enough to ask the Examiner whether or not there accompanied the model the storage batteries and the mercury for filling the mercury cups.

Mr. Blakeslee: We object to this question put to the Examiner because the Examiner is not quali-

fied to testify, not having been shown to know what a storage battery is or what mercury cups are, and not having been shown to have ever seen these features so that he could testify whether they came or not.

Mr. Westall: I should like to have the record show that while defendant's time to take this testimony was limited to the 1st of September, and it was understood that the model in its entirety would be in the hands of the Examiner and accessible to the defendant, that the complete apparatus was not furnished and that the defendant has been compelled to proceed with the examination in the absence of the parts which have been especially inquired of by counsel.

Mr. Blakeslee: We object to any such statement, inasmuch as the storage battery referred to was not part of the exhibit as offered, and, furthermore, counsel has established, as we concede and as we have always admitted and shown, that there was no source of electrical energy in this model, there being a certain feature substituted for the dynamo 8 of the Lyndon patent. As far as the mercury is concerned, we will state that the Examiner has today notified complainant that he did receive a bottle of what he supposed was mercury, with this model, and that being the case, we have no objection to the inquiry as to whether that bottle of mercury came with the model.

The Examiner has produced a bottle which came with the model and which complainant contends is a bottle of mercury furnished by complainant for use in the mercury cups.



Mr. Westall: Let it be noted of record that the storage battery did not accompany the model and that, therefore, the model was incomplete in so far as it was not accompanied by the storage battery.

Mr. Blakeslee: We will not agree with this statement. We contend that the storage battery was not a part of the model as offered in evidence, but was, in fact, merely a source of electrical supply and would not be furnished with such a model any more than an electrical circuit would be furnished in a building providing an electrical fan. The storage battery was not offered with the model. There was no source of electrical energy offered with the model. Furthermore, there is a source of electrical energy in this room in which the model now stands.

Mr. Westall: Do I understand counsel to state that a storage battery was not used with the model when it was exhibited and operated by the witness Henry in San Francisco?

Mr. Blakeslee: On the contrary, the record shows that that model was electrically energized and we repeat that there was a storage battery used for that purpose, but that it was not a part of the model and was used because it was merely a convenient source of electrical supply and was not offered with the model. That storage battery was obtained from the automobile of complainant, and a similar storage battery could be obtained from almost any well-equipped automobile if counsel for defendant or the witness had attempted to procure it.

XQ. 48. By Mr. Westall: However, your ob-



jections to this Lyndon Patent Model on the score that it is initially hand-operated likewise should attach to your manual movement of the parts of that model at the time you inspected it, should they not?

A. I do not admit any such conclusion.

XQ. 49. You would not be able to get a full demonstration of the mode of operation of that model from a primary actuation by any such piecemeal manual movement of the parts?

A. I believe that I would, and I was quite satisfied to accept the operation of the model in the general sense as described by the witness Mr. Henry and as verified by my detailed examination of the various operative features and by my serial operation of these various features by hand or by hand in connection with the electrical motor at the back of the model.

XQ. 50. But you did not make any complete operation of this model without manual intervention, did you?

A. No operation of the model is possible in any event without manual intervention.

XQ. 51. Then you did not make any complete operation of this model without manual intervention at some point in the model beyond the prime mover of the model, which is a hand-wheel or crank, did you?

A. I did not, for reasons which I have elsewhere fully stated.

XQ. 52. Could you get the proper co-relation of the proper factors of time, force and distance perti-

ment to the actions of the several respective features of this model when you operated those features separately by hand?

A. I have stated that the various features were operated individually by hand. I should, perhaps, state more fully that I was accompanied by an assistant, and here were therefore two persons and four hands for the operation of the various features of the model. I satisfied myself that under these conditions with both persons engaging in the operation of the model the various relations referred to could be satisfactorily determined and exhibited. Furthermore, the time and distance relations referred to generally in the model make no pretense of representing the same relations in actual operating power-plant governing.

Mr. Blakeslee: We ask that the last sentence of the answer be stricken out as not responsive to the question.

XQ. 53. You could not be sure, could you, that there was actual synchronism in the actions of the four hands of two persons applied to these parts?

A. As I have stated in my previous answer, I fully satisfied myself by means of the two persons that every operative feature proceeded in the same general manner and character as described by the witness Mr. Henry previously referred to, and I satisfied myself fully regarding the various co-relations of these various movements.

XQ. 54. But you had, to sum the matter up, to attempt to operate the device from a single-movement-initiating part?

A. The device is not susceptible of movement from a single initiating part. It requires the cooperation of a man turning the hand-wheel in front, a source of energy driving the main shaft and attached parts, and a source of electrical energy for the energization of various contacts and the movement of various elements, thus involving the cooperation of at least three distinct sources of energy.

XQ. 55. And each of these three distinct sources were not utilized by you in moving the parts of this model?

A. The source of electrical energy required to energize the four magnets to which previous reference has been made.

XQ. 56. And did you turn the hand-crank wheel as you call it?

A. I did.

XQ. 57. And upon turning it you were not able to set up the sequence of operation which would have occurred if there had been an energization of the four magnets?

A. I was able to obtain the significant sequence of operation with reference to each of these magnets individually, thus: Upon turning the hand-wheel the movement could be made by hand energizing the magnet corresponding to the magnet 15 of the Lyndon specification, thus setting in motion the train of events resulting in the operation of the shaft to which various other movements were connected and, in particular, operating the return or secondary belt, and likewise returning the bar corresponding to the

solenoid core 34 to or toward the normal position. This was done many times and until I became thoroughly satisfied regarding the co-relation of these various movement. In the same manner and while this shaft was in operation the armature corresponding to the magnet representing magnet 34 in the Lyndon specification and engaging clutch 58 was moved, throwing into operation a train of mechanism resulting in the movement of the by-pass valve. And, in the same manner, the elements representing clutch 22 23 of the Lyndon specification could be thrown into operation, thus setting into motion or tending to set into motion the returning rod 25 or the rod on the model corresponding thereto. In all of these cases I satisfied myself regarding the various co-relations involved, and that they admitted of operation in the sense described by the witness Mr. Henry, as previously referred to.

XQ. 58. You were, of course, not able to determine from merely turning the hand-crank or wheel what time would elapse, if any, after the movement of the sliding bar of the model before the clutch 57 58 would be thrown into play, were you?

A. Such would obviously depend upon the particular adjustments of the contacts, and as these were inoperative through the absence of any source of electric energy, it is clear that such co-relation did not directly follow from the adjustment of the contacts. I was able, however, to render such clutch operative at will at any time interval, counting from the beginning of movement of the shaft corresponding to the driveshaft 12.



XQ. 59. And those things you determined by separately manipulating the various parts by hand, did you not?

A. I did.

*adjournment. Readings & appearances nullified.*

August 26, 1915, A. M.

XQ. 60. You have referred to the possibility of reading into the returning device a number of other features than the rod 25, upon the assumption that these other features to some extent enter into the operation of or are necessary to the operation of the rod 25. There are certain features of the construction of the patent in suit which are essentially associated with the operation of the returning rod 25, are there not, namely, the clutch numbers 22 and 23, the lever 24 and the electromagnet 32, which operates the lever to cause the clutch to operate?

A. The items which you mention are certainly necessary to the operation of the returning device. They are, however, no more necessary than is the circuit 102 or the contacts 45 46 and 45a 46a, the lever 43, and the various other elements which I mentioned in my previous answer, since without these the returning device would remain wholly inoperative. I would further point out that in my discussion of this matter I did not attempt to read into the interpretation of the term "returning device" these various operative elements to which reference has been made, but I stated, rather, that if any one of these elements is included, there seemed as good reason for including any or all of the others.



XQ. 61. Are we to understand you as meaning that there is as good reason for including the lever 43 in the returning device as for including the lever 24?

A. In the sense that without the lever 43 the returning device would be wholly inoperative, there is equally good reason.

XQ. 62. The lever 43 is essential to the energization of the circuits 102 and 105, both, is it not?

A. It is.

XQ. 63. Therefore it pertains in the performance of its function to the control of the returning device as well as to the control of the by-pass, <sup>does it</sup> does it not?

A. It does. It exercises in a sense a double function, one of which functions is the control of the current flowing to the magnet 32.

XQ. 64. And the lever 24 exercises only a single function, does it not?

A. That is correct.

XQ. 65. And you could eliminate the lever 24 without impairing the action of the lever 43, whereas you could not eliminate the lever 43 without impairing the lever 24. Is that not correct?

A. That is correct.

XQ. 66. ~~It is~~ <sup>Is it</sup> not then proper to say that the electro-magnet 32, the circuit 102, the contacts 45 46, the clutch members 22 and 23, and the rod 25, constitute a group of features whose functions will pertain to the action of the returning device, and

none of which features are used for any other purpose than affecting such action?

A. I should state in answer that the function of the elements which you mention pertain directly to the operation of the controlling device. There remain the further series of items which I have previously mentioned, the function of which also pertains to the operation of the returning device, while in addition they are entrusted with other functions as well.

XQ. 67. And there likewise remains, does there not, a change in load conditions upon the circuit to be governed prior to the action of the governor in any of its parts?

A. I do not understand the meaning of your phrase "a change in load conditions upon the circuits to be governed." Will you please put the question a little more clearly?

XQ. 68. Question withdrawn. And the governor itself as an entirety will not operate unless there has been a change in load upon the water-wheel with which the governor is associated?

A. It will not.

XQ. 69. And therefore, I suppose, it might be consistent to say that it required the cutting in or out of a power consumer supplied by the water-wheel governed before the returning device can work?

A. That is unquestionably true, in this sense: that the returning device will not work under other conditions.

XQ. 70. And yet you would not go so far as to say that a knife switch upon the circuit supplied by the generator operated by the water-wheel associated with the governor was a part of the returning device, would you?

A. I would not. My entire point has been that in order to avoid this maze of inconsistencies into which one might be led in attempting to include the rod 25 and all of the operating elements which serve to bring it into operation, it would seem more consistent with a clear definition of terms to restrict the application of this term to the rod 25.

XQ. 71. Is it not clear that the following language from lines 116 to 119, inclusive, page 3 of the patent in suit, make it clear that rod 25 is not the entire returning device within the meaning of the patent, such language being as follows: "The rod 25, disks 22 and 23, and the controlling clutch-magnet 32, constitute a returning device for preventing the governor from overrunning?"

A. The language which you have quoted from the descriptive matter of the patent unquestionably gives the designation "returning device" to the elements which are there mentioned.. I find here simply another illustration of the many inconsistencies of language throughout the patent specification description and formulation of claims. In my attempt to determine the true meaning of the term "returning device" I therefore interpret the document as a whole, and base my conclusion on what seems to me an overwhelming preponderance of evidence in fa-

vor of the interpretation which I have given. The evidence to which I refer is contained in the quotation which I made from the patent and the claims in my answer yesterday, to question No. , in which I so quoted in defining the returning device.

XQ. 72. As a matter of fact, there is no point in the specification of the Lyndon patent in suit in which the returning device is said to be merely the rod 25?

A. There is not. I drew my inference from the fact that in the language of the claims as referred to in the answer to the previous question, those elements as referred to in the present discussion are separately claimed, and I therefore conclude that they are not to be considered as constituting essentially the returning device themselves.

XQ. 73. You do not take it to mean that a separate element is implied when the specifications and claims refer to a returning device as "provided with a clutch" or "provided with actuating means", as set forth in claims 3 and 4, do you?

Mr. Westall: Counsel for the defendant would ask counsel for complainant to state whether his contention is that if one should say "a boy provided with a bicycle", whether he would contend that the bicycle was part of the boy.

Mr. Blakeslee: This is not a time to discuss elementary questions of patent law or mechanics, or discuss matters of common sense.

A. In claim 3 the phrase is "a returning device . . . provided with." In claim 4 the phrase is "a



returning device . . . provided with actuating means." In claim 5 the phrase is "a returning device adapted when operated to return the circuit controller to normal position, a clutch adapted to bring said returning device into operative connection with the water-gate-operating shaft." In the last quotation it is very clear that the clutch is claimed as an element separate from the determining device, since the words "a clutch adapted to bring said returning device" can only mean that the returning device is to be brought into operation by an element outside of itself or not included in this designation. That is, to my mind, perfectly clear and conclusive as between these two elements, the clutch and the rod 25. The language of claims 3 and 4 as quoted is less conclusive, although in my opinion it properly admits of the construction which I have placed upon it. If, however, I interpret claims 3 and 4 in the light of the language of claim 5, I can reach no conclusion other than this: That the returning device is intended to be designated separately from the elements which serve to bring it into operation.

XQ. 74. By Mr. Westall: And when the clutch 22 23 brings the remaining features of the returning device into operative connection, it puts the belt into operation also, does it not? So that its parts move with the remaining features?

A. My own statement of this chain of operations would be rather in these terms: When the clutch 22 23 brings the returning device 25 into operation,



the parts connected beyond 25 move in the sense intended in the Lyndon specification.

XQ. 75. The rod 25, link 25a clutch disks 22 and 23, lever 24 and electromagnet 32, can all be removed from the governor of the patent in suit without in any manner affecting the performance of the functions of any other elements of the machine, and said recited parts all cooperate together in the returning action disclosed in the patent. Is that not correct?

A. The removal of the parts which you mention would result in the entire inoperativeness of all other parts lying beyond them in the chain of operation and to which the rod 25 gives movement and determination of function. In this sense, therefore, the removal of the parts which you have mentioned, would result in a profound change in other parts of the governor.

Mr. Westall: Counsel for defendant suggests that if it will be of any assistance in curtailing this part of the examination, that counsel will admit there are a great many elements which might properly have been included in the term "returning device." But the situation is that the question is not what might have been included in the term, but what the patentee has mean when he used the words "returning device" in his claims.

XQ. 76. By Mr. Blakeslee: But if you eliminate those parts you would only eliminate the returning device function of the patent disclosure, would you not?

A. If the parts which you mention were eliminated, the general function of return would be eliminated and the remaining parts would constitute what might be termed a single or direct-motion governor, with no attempt at compensation or return. This answer has fundamental reference to the function in the sense of the entire returning function necessary to control the operation of the gates and prevent over-run.

XQ. 77. And the other groups of elements in so far as their own autonomy is concerned, would not be impaired by such subtracted mentioned features as to their respective organizations or actions individually considered. Is that not correct?

A. They would not, in the sense in which I stated in my last answer that the remaining parts would constitute a form of direct-motion governor without attempt at providing the returning or compensating function.

XQ. 78. I think the answer is hardly responsive, Professor, and I will ask you to reconsider the question.

A. I should be very glad to. Let me hear the question again.

XQ. 79. See if you can answer it yes or no. Or, I will restate the question, as follows: With the subtraction of these enumerated parts would not the remaining groups of parts act in their individual capacities without any impairment of the individual functions due to such a subtraction?

A. They would, insofar as their own individual

or single movements are concerned. The combination of such movements with reference to a governing water-power unit would, however, be profoundly modified.

XQ. 80. And there would be eliminated the important returning function to prevent over-running of the governor, disclosed in the patent in suit. Is that not correct?

A. It is.

XQ. 81. In line 26 on page 2 of the specification of the patent in suit, what you have referred to as the returning device 25 is referred to as the "returning-rod", is it not?

A. It is.

ZQ. 82. Then in the light of that language, there is no inconsistency, is there, of grouping with this rod the clutch mentioned in line 52 of page 5, and calling the clutch and the rod, together with the other features necessary to the action of the clutch and rod, a returning device?

A. There is not, in so far as we may confine the consideration to the language which you have quoted. This, again, is another illustration of the many inconsistencies in the phraseology of the patent and claims, to which I have made reference. With particular reference to the matter of the clutch I repeat that I must consider the language of claim 5 as conclusive, where the returning device is referred to at one point, and a clutch adapted to bring said returning device into operation is referred to at another point.

XQ. 83. And the clutch brings the returning rod into operation, does it not?

A. The language of claim 5, page 5, line 53, is, "a clutch adapted to bring said returning device into", etc.

XQ. 84. If, for the purpose of this claim, you considered the returning device the returning rod 25, as referred to in lines 26 and 27 of page 2, both the rod and the clutch can be taken together and grouped under the broad term of a returning device, can they not?

A. In my opinion they cannot, since in the language quoted in my last answer the two are clearly differentiated in the mind of the inventor.

XQ. 85. But he likewise refers in the matter just referred to to the part 25 as a returning rod, and that part is brought into operative connection with the water-gate-operating shaft by the clutch, is it not?

A. It is.

XQ. 86. When the clutch 22 23 is set by the energization of magnets 32, it becomes a part of the working returning system, does it not?

A. It does in the sense that it is in operative connection with the rods 25a and 25, and therefore moves with them.

XQ. 87. And when those clutch members are out of contact there is no complete working returning system extant, is there?

A. I should prefer to state that the returning



system is inoperative. It exists, but, due to the relation of certain parts, it remains inoperative.

XQ. 88. And there is no returning action?

A. There is no returning action.

XQ. 89. And when those parts are in co-engagement there is a returning action?

A. There is.

XQ. 90. This clutch 22 23 comprises in effect two frictional co-engaging disks, does it not?

A. It does.

XQ. 91. And that co-engagement is effective to a degree determined by the pressure urging the disks together, is it not?

A. It is.

XQ. 92. This clutch is not a positive clutch in the exact sense of a clutch of the jaw type or a clutch of the cone type, is it?

A. It possesses the fundamental characteristics of a clutch of the cone type, since such clutches depend upon friction for the engagement. In fact, as is well known, a plain disk is simply an extreme geometrical case of a cone.

XQ. 93. In the same sense that a circle is a polygon?

A. I should prefer, rather, to state that a plane disk is a cone of 180 degrees angle.

XQ. 94. But is a cone which you could not truncate?

A. You could not.

XQ. 95. Well, let us divide clutches up into two classes, jaw clutches and pure friction clutches.



There is a marked degree of difference in positiveness of action of these two classes of clutches, is there not?

A. There is.

XQ. 96. And in the friction type of clutch the co-engagement of the clutch members is effective in proportion to the pressure under which such members are held together. Is that not correct?

A. It is. It depends upon the pressure, upon the angle of the cone, upon the areas in contact, and upon the natures of the two surfaces.

XQ. 97. There is nothing in the specification of this patent which has bothered you in grasping the disclosure of the patent to such an extent that any of your previous answers have been made with any mental reservation due to such doubt, is there?

A. No.

XQ. 98. Now, let us assume that the power of the pull of solenoid 33 is greater than the strength of frictional hold of the disk 22 in its engagement with the disk 23, or that the degree of such effort of the solenoid is greater than the degree of frictional resistance between the disks, in a governing action of the governor of the Lyndon patent. In that case will the lever 26 move under the action of the clutch 22 23 from a position in which it is held by the core 34 of the solenoid?

A. In answering this question I will first point out that the connection between the solenoid core 34 and the clutch disk 22 is through a lever 26 with whatever particular ratio of lever arms the con-

struction may show, and that also the tension of spring 29 comes into a consideration of the point raised by the question. In this sense I understand the question to call for a determination of the result should the pull of the solenoid core 34 as transmitted through the lever 26 and as influenced by the spring 29 prove greater than the frictional drag between the two parts of the disk. In replying I would say that if such a condition were possible, unquestionably the solenoid core would take charge and would refuse to be moved under the conditions which you have assumed. I must, however, point out that the condition which you have assumed is entirely foreign to that which exists under the governing operations of the elements mentioned, since, as I have already pointed out in my discussion of the operative features of this mechanism, the core 34 at the beginning of a governing movement will find itself entirely free to move, and it will not answer, for illustration, an excess pull of the solenoid, moved inward, and assume a position of equilibrium under the existing conditions. While in this condition of equilibrium the force required to start movement of the solenoid core 34 is zero. That is to say, at the very instant of starting the solenoid core exercises no opposition to movement. The instant, however, movement is initiated, the resistance will gradually increase, due to the operating conditions in play. It follows, therefore, that in the case of a governing operation, at the instant when clutch members 22 23 are thrown into engage-

ment, the action on core 34 is such that the initiation of movement may be produced against a force beginning at zero and gradually increasing, as I have previously pointed out. It follows, therefore, that even a slight degree of engagement of the clutch members 22 23, assuming that such were sufficient to overcome the resistance of spring 29, would serve at least to initiate movement in the core 34.

XQ. 99. Do you find any disclosure in the Lyndon patent which negatives the assumption that as a matter of fact the clutch members 22 23 do slip one upon the other during all phases of a given governing action until that governing action has been so far completed that the pull in the solenoid is faint enough so that the friction between the disks move the core 34 and terminates the governing action, thus preventing an overrunning of the governor?

A. There is no wording in the language of the specification or description or claims implying either the presence or absence of slip in the clutch members. It is, of course, entirely possible that with a clutch constituted in the manner disclosed in disks 22 23 that slipping might occur and would occur provided the resistance to be overcome were greater than the engaging drag between the members of clutch. I point out, however, referring to the language of your question, that is, the rod 25 moves in answer to the movement of clutch 22, carrying thereby lever 26 and solenoid core 34, the resistance of such movement beginning at zero gradually in-

creases as the solenoid core is drawn out of equilibrium. The function of return or arrest of governing action is, however, primarily determined by the breaking of contacts 40 or 41, and this, as I have previously pointed out, will depend not only on the various elements which have been referred to in my answer to the present question, but also to the adjustment of the contacts themselves.

XQ. 100. The circuits cannot be broken at the contact 40 and 41 until the core 34 moves, can they?

A. They cannot.

XQ. 101. And whatever the particular factors involved may be, the core 34 cannot be moved, due to the action of the returning device, until the friction between the disks 22 and 23 is of sufficient holding nature to cause the rod 25 to move and the core 34 to be moved in response to such movement. Is that not correct?

A. That is correct.

XQ. 102. Now, referring to the Lyndon Patent Model, what do you find therein with respect to the relation between the pull of the solenoid corresponding to the solenoid 33 and the opposing action of clutch disks corresponding to disks 22 and 23, in any such examination as you have made thereof.

A. I find no solenoid whatever as part of the model, nor any equivalent thereto; and, therefore, I do not find any complete similarity of relation between the part which you mention.

XQ. 103. Don't you find in that model any equivalent of the core 34 of the solenoid?



A. I do not.

XQ. 104. As a matter of fact, if you move the sliding bar of the model, namely, the bar connected with the lever corresponding to the lever 26 in the Lyndon patent, no matter how you move that bar, are not the same effects produced as are produced in the Lyndon patent upon moving the core 34, irrespective of how that core is moved? And in this question you may limit the answer by consideration of the effects produced upon the lever 26.

A. The movement of the bar to which you refer on the Lyndon Patent Model produces movements on a lever which represents lever 26 of the specification, and as a result of which contacts are made or broken in a manner entirely similar to that contemplated in the Lyndon specification.

XQ. 105. Then in what respect is there a failure of equivalence between such bar and the solenoid core 34?

A. The failure arises from the fact that the solenoid core 34 moves directly responsive to a change in speed and as a consequence of such change of speed and through the action of electromagnetic forces as described in my previous discussion of the operation of these parts, while the rod on the model corresponding to the solenoid core 34 is moved by a direct mechanical connection with a hand-wheel, and is not therefore responsive to changes of speed.

XQ. 106. But if you produce the same movement in the bar that you do in the core for the purpose of these corresponding movements, the bar and the core perform equivalently, do they not?



A. I do not so understand the interpretation of the word "equivalence". In my understanding of this term it must involve the relation of the operation to the operating causes or to sequences. The movements themselves, in so far as such movements bring about electric contacts, may be entirely the same. They are, however, related to the producing causes in an entirely different manner in the two cases, and the producing causes are thus entirely different.

XQ. 107. Then I take the distinction to be that which you have previously made between voluntary actuation and involuntary actuation.

A. That is one element. There remains also the further element of electromagnetic operation with a delicate inter-play of forces in one case, and direct mechanical action in the other. Likewise, the relation of cause and effect between the change of energization in the solenoid, and the movement of the core in one case and the common results of a change of speed and a movement of the corresponding bar in the case of the model, such results being directly due to a voluntary movement of the hand-wheel.

XQ. 108. But if the movement of the core and the bar were exactly the same in extent, rate and phasing, could you draw any distinction as between the performance of these two features which would render them non-equivalent?

A. They could not be the same without the operation of human intervention, which is entirely for-

eign to the chain of events contemplated in the Lyndon specification throughout its entire composition, and I must therefore continue to conclude that the bar which is moved by mechanical forces put in play by human agency is not the equivalent of a bar which is moved by electromagnetic forces put in play by the operation of inanimate forces.

XQ. 109. This same kind of a distinction is to read into your testimony, <sup>it is</sup> ~~it is~~, namely, your testimony which deals with your operation of the parts of this Lyndon Patent Model by hand, and the comparison on such manual operation of the parts with involuntary operation of the parts?

A. My manual examination of certain features of the Lyndon Patent Model was, as I have previously stated, for the purpose of familiarizing myself with their character, and with their operative features. The distinction which I draw in the two cases lies in this: that as between the operation of the Lyndon Patent Model and the device contemplated in the Lyndon specification and which is intended to represent an operative power plant and governor, the latter is operative entirely independent of human intervention, while the former depends for its operation upon human intervention. I therefore conclude that the elements in the model which are directly operated by human intervention cannot be considered as the proper equivalents of those in the device contemplated in the specification which are operated entirely independent of such human intervention.

XQ. 110. Assuming that the governor shown in the Lyndon patent in suit were applied to a hydro-electric plant, the circuit supplied by which included a heavy service consumer of energy controlled by manually operated switch as, for instance, switches or controllers operated by hand. Would it not be proper to say that there was a manual control of the load, and, therefore, a manual effect produced upon the speed variation and, resultantly, a manual effect produced upon the governor to cause it to act?

A. In my opinion it would not, in the ordinary use of language. It is entirely true that the opening or closing of a switch such as you have mentioned would result in a change of load. At this point human intervention ceases. This operation then throws into play a train of events leading to a demand for greater power from the prime mover the speed of which, due to insufficient water at the moment, begins to decrease, and as a result of which a train of events is initiated, bringing about ultimately the movement of the solenoid core 34 and the making of certain contacts which are intended to bring about corrective movements of the wheel-gates. In the case of the Lyndon patent model the hand-wheel which operates to produce a change of speed at the same instant and in parallel likewise operates mechanically to move the bar which is intended to correspond to the solenoid core. I cannot in any way bring myself to believe that these two operations are in any manner similiar or equivalent, using such words in reference to the operation of a water-wheel-governing device.

XQ. 111. There are working parts interposed between the hand-wheel or crank and the bar in the model, are there not?

A. There are.

XQ. 112. And in the case assumed in the question next preceding the last question there would be working parts interposed between the core of the solenoid and the hand switch on the circuit, would there not?

A. There would.

XQ. 113. And in both instances the first cause of the action would be a voluntary manual actuation. Is that not correct?

A. It is.

XQ. 114. Then I take it there must be some distinction between the mechanical pull on the bar and the electromagnetic pull on the solenoid core which could not enable you in manually working the levers and other parts of the model to get any idea how those parts would work if they were electromagnetically operated. Is that correct?

A. It is not.

XQ. 115. Now, if the contact points of the contacts at 40 and 40a, or, 41 and 41a, were slightly or materially immersed in mercury in the contact cups, quite some appreciable movement of the lever 26 could take place before electrical circuits were opened at such contact. Is that not correct?

A. It is, as I have stated in my answer while discussing the operation of these various elements.

XQ. 116. Therefore, the rod 25 of the return-



ing device might play somewhat, and the lever 26 might play somewhat, over an appreciable range of movement, and the core 34 might be appreciably moved without the clutch gears 9, 10 and 11 being thrown out of operation, the clutch 22 and 23 being thrown out of operation, or the clutch 57 and 58 being thrown out of operation. Is that not correct?

A. That is correct, as I have previously stated in my discussion of the operation of these elements.

XQ. 117. In Mr. Henry's narration of the operation of the Lyndon Patent Model, during which he testifies he was operating the model, do you find any reference to any intermittent action of the clutch containing the parts 9, 10 and 11 to cause intermittent or step action of the water-gate-operating means, or of the by-pass-operating means connected therewith?

A. I do not.

XQ. 118. Have you been able to make out from your examination of the Lyndon Patent Model that any such intermittent action would take place?

A. The timing of such action would depend primarily upon two things: First, the adjustment of the mercury cups, and, second, the manner of turning the hand-wheel. It is entirely conceivable that in a certain particular case a certain particular interval could be made to intervene between the initiation of operation of the drive-shaft 12 and clutching of 22 23. In my analysis of the operation of these members I pointed out, however, that such interval in the model could have no direct or re-



sponsive relation with the character of the load change, thus insuring the absence of over-run in all cases.

XQ. 119. You are not prepared to say, are you, that judging from the disclosure of the Lyndon patent the governing action due to the alteration of the position of the core 34 from its normal position could not continue up until a close approach to the setting of the water-wheel gates at their proper positions for the new load, and that the clutch member 22 23 would not permit such action by slippage, and would only come into action to return the core 34, so that the water-gates would be held at their proper position, the governor having been prevented from over-running ?

A. I am.

XQ. 120. For what reasons?

A. For the reason that in the Lyndon specification the implied timing of the contacts is clearly simultaneous, as I have pointed out in my discussion of these operative features, and with such simultaneous timing and with any sufficient engagement of the clutch members 22 23, the operation of the bar 25, and the breaking of the contacts, would follow almost instantaneously upon the movement of drive-shaft 12. In this connection, I would furthermore point out that with the construction obviously implied the drive-shaft 12 when in operation will be moving at a high rate of speed and in consequence thereof the instant clutch members 22 and 23 become operative movement at considerable

velocity will be initiated, resulting in the prompt rupture of contact 40 or 41. In this connection I would further point out that the dependence upon slippage in the clutch members 22 23 to determine the period of operation of drive-shaft 12 would be wholly futile, since it is a well-known fact that it would be entirely impracticable to control such slippage with reference to such purpose, nor could such slippage have any responsive relation to the nature and extent of the load change.

XQ. 121. And you are prepared to make that statement without having completely operated the Lyndon Patent Model?

A. I am.

XQ. 122. As a matter of fact, the clutch disks 22 and 23 slip upon each other from the very moment they are brought into co-engagement if their adjustment was such as to permit of slippage at any time?

A. They would not.

XQ. 123. Why not?

A. Because, as I have previously pointed out, the resistance to the movement at the beginning of motion is relatively small, gradually increasing as core 34 is drawn from its position of equilibrium.

XQ. 124. And how about the inertia of rod 25 and its connected parts and the resistance of springs 29?

A. The inertia of the rod 25 and the resistance of the spring 29 obviously play a part in determining

the characteristics of the initial movement of the parts.

It is perfectly true that every friction clutch in bringing a stationary part into movement must momentarily slip, since no stationary member can instantaneously be brought into operation with full velocity. The move of operation of all such clutches, as is very well known, involves a very brief preliminary period of slippage while the clutch members are coming together and are developing a gradual drag or resistance between them. This gradually increasing resistance serves to overcome the initial resistance referred to and ultimately to bring the member into full movement without further slippage, provided a clutch is resigned to operate in this manner. Consequent upon a further increase in resistance it may well result that further slippage would follow.

XQ. 125. And if these clutch members 22 and 23 were designed to slip and only impart a slight thrust upon the rod 25 at any time, that thrust could be predetermined to be far less than the pull upon the core 34 excepting close to the termination of a given governing action. Is that not correct?

A. That is correct. I would, however, point out further that in such case and with the contacts 40 or 41 and the remaining contacts involved, might or might not be broken according to the particular adjustments involved. In all this, however, I must repeat that I do not find any element responsive to the nature of the load change.

XQ. 126. Is it not proper to say that the controller, such as mentioned in line 4 of claim 3 of the Lyndon patent and in line 5 of claim 4 of the Lyndon patent, includes, broadly, the lever 26 referred to in lines 7 and 8 of page 4, the controlling solenoid referred to in lines 99 and 100 of page 4, the same controlling lever referred to in line 20 of page 4, and the core 34 of the solenoid and the part 35 by which it is connected with the lever 26?

A. We are here again confronted with a series of inconsistencies in the use of terms. In line 4, claim 3, the single word "controller" is used. The same is true in line 5, claim 4. In lines 7 and 8 of page 4 the lever 26 is mentioned without other specific characterization. In lines 99 and 100 of page 4 the phrase "controlling solenoid" is used. In line 20, page 4, the "phrase controlling lever 26" is employed. Confronted with these inconsistencies, I turn to certain other places in the description and formulation of claims for further light as to the purpose of the inventor in using this term. On page 2, line 27, occurs the phrase "to exert pressure on the controller 26 to return it to normal position." This seems very clearly to restrict the application of the term to the lever 26. Likewise, on page 2, line 43, occurs the statement "connected at 39 to the lever 26 which acts as a circuit controller." This, again, seems to clearly indicate the lever 26 as the controller in the sense that it is the one thing which affects the operation of control. Again, on page 3, lines 62 and 63, I find the phrase "to such an extent



as to hold controlling lever 26 in its mean position." Here again the implication seems clear that the word "controller" is intended to apply to the lever 26. Again, in claim 5, lines 45 to 47, I find the phrase, "a core for said solenoid and a circuit controller actuated thereby." Here there is every clear distinction drawn between the solenoid core and the circuit controller which is actuated thereby. But the element which is actuated thereby is the lever 26, and I therefore conclude that it is this lever which is implied by the use of the term "controller." Again, in claim 9, lines 115 to 117. I find the words "an electromagnetic device connected to said dynamo; a controller operated by said electromagnetic device." Here again the inventor very plainly differentiates between the electromagnetic device and the element which is controlled thereby. But the electromagnetic device comprises, broadly, the solenoid 33 and core 34. This, therefore, is clearly differentiated from the controller which is operated by such electromagnetic device. Balancing the indication of these various quotations from the Lyndon patent description and claims, I must conclude that the inventor implied simply the rod 26 when he uses the term "controller."

XQ. 127. The contacts at the ends of the lever 26 are circuit-controllers, are they not?

A. They are. And in the sense of making such contacts it is necessary to the flow of current into the controlled circuits.

XQ. 128. Now, if the solenoid is a controlling



solenoid and the lever 26 is a controlling lever, and these parts cooperate, as of course they do, to make and break at 40 and 41, is it not a quibble to contend that those parts grouped together do not in effect and in function constitute a controller?

A. I am not so much concerned with what such parts might constitute in the proper use of language, as to interpret the proper application of these terms in the specification and claims of the patent in suit. I have repeatedly referred to the lack of consistency throughout the patent in the use of descriptive terms. And we find here simply further illustration of such lack of consistency. Confronted with such a condition I can reach a conclusion only by careful study of the various places throughout the patent and, for my own part, I should be disposed to give greater weight to the indications contained in the language of the claims than to the indications given by the descriptive part of the patent, and from the language which I have quoted, in particular from claims 5 and 9, the conclusion seems inevitable that the inventor by the use of the term "controller" had in mind the lever 26.

XQ. 129. The parts grouped together in my last question, however, in the Lyndon patent disclosure, do serve as a controller for the making and breaking of contacts at 40 and 40a, do they not?

A. In the ordinary interpretation of language they do. I cannot, however, so admit if we restrict the interpretation of language to that employed by the inventor in his claims, especially 5 and 9.

XQ. 130. And you prefer to consider that the controller lever 26 is the controller rather than the controlling solenoid, both such terms being used in the specification?

A. I prefer to consider that the inventor by the use of the word "controller" intended to refer to the lever 26 rather than to any of the other elements, and for reasons which I have already stated in detail.

XQ. 131. Are you familiar with the draughting of patent specifications through your own experience?

A. I am not.

XQ. 132. Are you familiar with the interpretation of letters patent?

A. I believe that I am, in so far as such interpretation turns upon the application of technical knowledge, common sense and fundamental legal principles.

XQ. 133. Have you ever served as an expert for the interpretation of letters patent in any actions at law or equity?

A. I have not.

XQ. 134. Are you at all acquainted with the doctrine of generic and specific terminology as used in patent specifications, preparation and prosecution?

Mr. Westall: Objected to as being an inquiry entirely into the law of patents, which is not within the scope of the duties of an expert to explain but is a matter wholly for the Court and has no bearing up-

on the qualifications of the witness to testify regarding any of the matters inquired about in this examination.

A. I have myself read a great many patents and I have also always supposed that I was able to properly interpret the language of such patents on the basis which I have previously mentioned, namely, technical familiarity with the subject in hand, common sense, and a fair knowledge of the fundamental legal principles.

Mr. Blakeslee: We ask that the answer be stricken out as not responsive to the question.

Mr. Westall: It is submitted that the answer is strictly responsive to the question, and we ask that the answer be allowed to stand.

XQ. 135. By Mr. Blakeslee: There is no doubt in your mind, is there, that the solenoid with its core, coupled in definite relation with the lever 26, and said lever 26, cooperate as a controller for the purpose of making and breaking contact at 40 and 41?

A. There is no doubt in my mind as to such cooperation for the purpose which you have mentioned, and especially using the term "controller" in the broad and indefinite sense. I must here again point out, however, that I am not attempting to define the word "controller" in a dictionary or general sense, but only to interpret this term as employed by the inventor in describing his invention and in formulating certain claims based thereon.

XQ. 136. Nor is there any doubt in your mind that the rod 25 and the clutch disks 22 and 23, to-

gether with the lever 24, and the electromagnet 22, cooperate together for the purpose of producing returning action within the meaning of the Lyndon patent?

A. There is none; and in this connection, the same as in my preceding answer, I point out that I am not so much concerned with laying down a dictionary or broad definition of the word "returning device" as with an attempt to interpret this term as used by the inventor in describing his apparatus and in formulating certain claims based thereon.

XQ. 137. Do not the dash-pots associated with the by-pass valve in the Lyndon patent tend to produce a rate of return of the dash-pot?

A. They do not produce a rate of return of the dash-pot except in an indirect manner. They modify and control the rate of return of the dash-pot. I should prefer to state that the return of the dash-pot is produced by the weights 70, such return being modified or placed under control through the agency of the dash-pot 69.

XQ. 138. My question was not whether these dash-pots do or do not produce the return of the by-pass, but whether or not they do not produce the rate of return of the by-pass valve.

Mr. Westall: Counsel for defendant will admit that the dash-pots perform no functions in returning the weights, but merely act as a retarding means for the return of such weights, if that is counsel is driving at.

A. In the interest of preciseness of language I



should prefer to state that the dash-pots determine or influence the rate of return and not that they produce the rate of return.

XQ. 139. By Mr. Blakeslee: Do they not cause the rate of return?

A. They do not. By this I mean that the rate of return of the by-pass valve is determined by the cooperation of a number of elements including the weights 70, the friction and inertia of the drum 55, and the influence of the dash-pots 69, and the hydraulic forces in play and operative on the valve itself. It thus appears that the dash-pot 69 are simply one of several elements which determine the rate of return of the valve. They may, however, by appropriate adjustment, be made to determine such rate broadly at any desired speed.

XQ. 140. Then is it proper to say that in any sense this rate of return is produced or caused?

A. I should be unwilling to employ the words "produced" or "caused" in this sense, simply because the dash-pots 69 represent simply one of a number of cooperating causes.

XQ. 141. Then I take it, Professor, that you are a materialist to the extent that production or cause must relate to the physical thing and not to the action of that physical thing. Is that correct?

A. I agree with your understanding of my attitude.

XQ. 142. And you prefer to use the term "set up" rather than "produce" or "cause" with respect to the rate of return?



A. I did not make use of the words "set up". The word which in my mind most concisely indicates the function of the dash-pots 69 is "determine". The operation of the dash-pot 69 is determinative on the rate of control of the valve.

XQ. 143. And there must be some rate always present before it can be determined?

A. That is correct.

XQ. 144. Then the determination of the rate does not account for the rate being present, does it?

A. It does not primarily, for the reason that the initiating cause of the return must be sought in the operation of the weights, 70, or, if you please, to go still further back, in the operation of the force of gravitation.

XQ. 145. Then the return and the rate thereof are interchangeable terms?

A. They are not.

XQ. 146. And the rate is produced by the return itself?

A. I have never coupled together the two words "produced" and "rate". I have always preferred to use the term "determine" in connection with the rate, and by this I mean a cooperation of conditions or agencies as a result of which a certain rate of return is set up. And the chief determining agent in connection with such rate of return in this present case is represented by the dash-pots 69.

XQ. 147. Then as to the causation in these respects the return of the by-pass valve constitutes the causation of the rate of return of the by-pass valve?

Mr. Westall: Objected to as manifestly an unanswerable question.

A. It does not.

XQ. 148. By Mr. Blakeslee: The causation of the rate of return of the by-pass valve is the action of the dash-pot. Is that not correct?

A. I have already stated that the causation of the return of the by-pass valve itself lies in the weights 70, while the determination of the rate of return lies in the cooperation of these weights with a series of other influencing or determining causes, chief among which I find the retarding operation of the dash-pots 69.

XQ. 149. Then the retarding operation of the dash-pots 69 are the chief causations of the rate of return by the by-pass valve. Is that correct?

Mr. Westall: Objected to as having been already thoroughly covered by the witness.

A. I have not referred to the dash-pot 69 as a causation of the rate of return, but as the chief determining element.

XQ. 150. By Mr. Blakeslee: Then is there any causation of such rate of return?

A. The causation of the rate of return is found, as I have previously stated, in the cooperation of these various agencies and resistances which are involved in the movement of the system comprising the by-pass valve, the weights 70, the drum 54, and other immediately connected elements.

XQ. 151. The dash-pots 69 no more cause the rate of return of the by-pass valve than the lever 26

causes the controlling action. Is that not correct?

A. The controlling action results directly and as a consequence of the movement of the lever 26. The rate of return is profoundly influenced by the operation of the dash-pots 69, and such dash-pots may be properly considered as the chief determining element. There seems to be no clear analogy between the operations involved in these two cases.

XQ. 152. Does not line 49 of page 2 of the Lyndon patent refer to the solenoid 33 as a controller by stating that it "also serves to control the action of the compensator-magnets and returning-magnets"?

A. The language which you have just used employs the phrase "serves to control." The term "controller" is not specifically employed. Here again I must refer to the inconsistencies in language throughout the patent, and to the lack of definite and consistent use of descriptive terms. From the language which you have employed it does not seem proper to assume in the light of the quotations which I have given in my answer to a previous question relating to this matter, that the inventor when he uses the term "controller" refers to the solenoid 33.

XQ. 153. Is there any better definition of a controller than "that which serves to control"?

A. A controller is obviously a thing which serves to control, and a thing which serves to control may inversely in ordinarily language be termed a controller. However, in the interpretation of this term I find it necessary to refer to other points in the Lyndon patent where this function or agency or ele-

ment is referred to, and particularly, for illustration, to page 2, line 27, where the inventor specifically uses the phrase "the controller 26", and again in various other places throughout the patent which I have quoted in my answer to a previous question relating to this matter, and to which I here specifically refer.

XQ. 154. Do you not think that the possibility of subjecting the Lyndon Patent Model to extremes in possible manual actuation permits a more perfect test of its operativeness and the performance of its functions than could be made where the parts were actuated responsive to changes in speed within the usual range of speed fluctuations in a modern hydro-electric plant?

A. I do not, for the chief reason that the model does not contain the fundamental characteristics of a water-power unit with a connected governor, and, therefore, whatever its mode of operation or whatever might be shown by such a model, I do not consider that it could be taken as conclusive of the operation of an actual governor and water-power unit as contemplated in the Lyndon specification.

XQ. 155. Is it not, however, possible to subject the model to more violent fluctuations and extremes of control by this manual actuation than would be present in the normal operation of such mechanism automatically controlled in a modern hydro-electric plant?

A. It is perhaps possible to subject the model under manual control to conditions intended to rep-



resent the utmost extreme conditions present in actual practice or even to conditions still more extreme. I repeat, however, that granting this to be so, such conditions in the Lyndon Patent Model stand in no responsive relation to load changes which occur in the case of an actual water-power unit and connected governor, and, therefore, I repeat, as in my previous answer, that no matter what may be shown by the operation of the model, as such it can furnish no safe ground for a conclusion as to the operative features or practicability of the actual hydraulic water-power governor.

XQ. 156. Starting with the sliding bar in the Lyndon Patent Model which takes the place or is intended to take the place of the core 34 of the solenoid in the Lyndon patent, do you find any substantial disagreement as between the features of that model and the features of the Lyndon patent with respect to construction and interrelation of parts and mode of operation with the inverse operation of the water-wheel gates and the by-pass valve, with the return of the by-pass valve to a usual position and the operation of the returning device intended to prevent the over-running of the governor.

A. I think that I have already fully answered this question in my discussion of the operative character of these various elements. I will repeat, however, that from the bar to which you have referred, onward, I find substantially the equivalents of the Lyndon Patent Model as contemplated in the Lyndon Patent specification up to and including the op-



eration of the shaft 12 of the Lyndon patent specification. From this point on there develops an immediate and important divergence, namely, in the Lyndon Patent Model the operation of a shaft corresponding to 12 of the patent specification produces immediately and positively a movement of the secondary belt, thereby mechanically compelling a change of speed. In the operation of an actual hydraulic water-power governor as contemplated in the Lyndon specification, the operation of the shaft 12 results in the movement of a water-gate either by way of opening or closing, leaving the question of the return of speed to normal value to the interaction of an exceedingly complicated system including the inertia of the main water-wheel unit and connected parts, and resistance to be overcome in the driving units, friction, windage, electromagnetic interaction between the electric generators and the line, and all other forces and agencies which may be involved in the interaction between the flow of water on the wheel and the operation of the moving parts.

XQ. 157. In other words, the Lyndon Patent Model shifts the secondary belt to correct any speed disturbances, and the Lyndon governor in practice is intended to shift the water-wheel gate to correct any speed disturbances. Is that a proper statement?

A. That is a proper statement, with the further qualification that in the Lyndon Patent Model the change of speed results directly as a mechanical se-

quence of the movement of the belt, while the only direct consequence of the movement of the water-gate is the change in the supply of water to the wheel, thereby leaving the question of the modification of speed to the inter-action of the various forces which I have previously mentioned.

XQ. 158. Then in the operating Lyndon water-wheel governor, if put into practice, you would find a water-gate or water supplying device shifted or moved in part or in whole, where as in the Lyndon Patent Model you find a belt shifted or moved to produce the change of speed. In either case is that not correct?

A. That is correct.

XQ. 159. Now, aside from the tests you have recently made, the Lyndon Patent Model discloses the returning device as such of the Lyndon patent, the water-wheel as such, the by-pass valve as such, and the means for slowly returning the by-pass valve as such of the Lyndon patent, the by-pass valve being related inversely to the water-wheel gate. Is that not correct?

A. I cannot agree with your statement in the way in which you have put it. You refer to a returning device as such, and a water-wheel as such. It is true that the Lyndon Patent Model does include a returning device as such. It does not, however, include a waterwheel as such. It includes merely the representation of a water-wheel. It does not include a by-pass valve as such; it merely includes a representative of a by-pass valve, or, if you please,

a model of a by-pass valve, but which is not placed in its proper operative relation by reason of the absence of water in the case of the Lyndon Patent Model.

XQ. 160. Can you answer the question affirmatively with the qualification last made?

A. With the limitations or explanations which I have formulated in my answer to the last question, I am willing to state that I find on the Lyndon Patent Model a returning device as such, a representation of a water-wheel and of a by-pass valve so connected as to illustrate the movements and relations to which you refer, and with special reference to the inverse relations which you have mentioned as existing between the movement of the by-pass valve and that of the main water-gate.

XQ. 161. That is, you do find those?

A. Yes.

XQ. 162. Does not the bar in the Lyndon Patent Model—that is, the sliding bar we have referred to—move coincidentally with a change of speed of the water-wheel?

A. It does in the sense that it moves coincidentally in speed with the movement of the main wheel which thus produces change in speed of the model. This statement must be, however, considered in view of the possible influence of the movement of the secondary belt by way of return on the sliding bar to which you have referred.

XQ. 163. Then there is introduced in the Lyndon Patent Model volunteer or manual means for

shifting the position of the sliding bar in substitution for the automatic speed-sensitive means, including the dynamo 8. That is correct, is it not?

A. That is correct.

XQ. 164. Such means including the hand-lever or wheel we have referred to?

T. That is correct.

XQ. 165. The gradual movement of the core of the solenoid of the Lyndon patent finds its counterpart, does it not, in the gradual movement of the speed-sensitive element of such a governor as the fly-ball governor?

Mr. Westall: Objected to as not proper cross-examination. There was no examination of this witness upon the subject of equivalence of the device of defendant, and the question is clearly outside the scope of that examination.

Mr. Blakeslee: This question is not for the purpose of establishing equivalence, but merely for the purpose of comparison and illustration and definition of the action of a solenoid core.

A. The action in the two cases which you have described are analogous and, broadly speaking, they represent means adapted to produce similar or analogous results. The details of the movement, however, are entirely different in the two cases.

XQ. 166. As soon as the solenoid core 34 starts to move, does not the governor commence to act? Or, let us say, as soon as the solenoid core is moved to such a degree that the contact can be initiated at 40 or 41?



A. It does, or, at most, within a very short interval of time, such interval of time being simply that required for the energization of magnets 15 or 16, the movement of the armature 17, and the establishment of effective engagement between the clutch members 13 and 13a or 13b.

XQ. 167. And such time element would in practice be but a small fraction of a second, would it not?

A. Under ordinary circumstances it would.

XQ. 168. And then if the contacts 40 and 41 were effected by immersion of the points in mercury, the action of the governor would continue at all times during such immersion, irrespective of the depth of immersion. Is that not correct?

A. That is correct.

XQ. 169. And would it not be feasible to float glycerine upon this mercury to prevent any untoward deterioration of the same, such as by oxidation?

A. I have had a considerable amount of personal experience with mercury contacts and have never found them satisfactory over long periods of time, and specially where careful adjustments of time relations were necessary. The floating of such substances as I have employed on the surface of the mercury does tend to reduce oxidation, but I have found substituted therefor the development after a period of time of what I have termed a form of mercury emulsion. That is a form of mixture or suspension of mercury in very fine globules carried in the liquid and maintained there by the churning



or agitating action developed by the movement of the contact points in and out of the mercury. The development of such a mercury emulsion I have found to seriously interfere with the satisfactory operation of such contacts.

XQ. 170. How long a period of time have you been able to use such a mercury contact cup without replenishment or substitution of a fresh content of mercury?

A. Such time would depend entirely upon the frequency with which the contacts are broken or made. In one case which I clearly call to mind at the present time and in which the contacts were broken and made only a few times each day, the operation ran satisfactory over a few weeks of time—possibly two weeks—although I cannot recall the exact period. In the end, however, they became unsatisfactory and other means were adapted for the operation of the mechanism. In the case of a water-wheel governor where with an irregularly varying load the contacts would be presumably made and broken, many hundreds or even many thousands of times per day, the disturbing actions to which I have referred would, in my opinion, develop with much greater rapidity.

XQ. 171. How frequently would you advocate the replenishment of lubricant in a water-wheel governor such as that disclosed in the Lyndon patent, where there are any bearing surfaces?

A. This question would depend wholly upon the nature of such parts. But under modern conditions

of lubrication with reservoir supply, it would be entirely feasible to render such bearings operative satisfactorily with a renewal of lubricant at very long intervals, such, for example, as one, two or three months, even. Where the reservoir system of lubrication might not be practicable, more frequent lubrication would of course be necessary.

XQ. 172. In water-wheel plants there is an attendant employed whose regular duty is to inspect for the purpose of maintaining proper lubrication? Is that not correct?

A. There is always an attendant in water-wheel plants, and one of the duties of such attendant is, naturally, to inspect regarding all matters relating to lubrication.

XQ. 173. That is a daily duty, is it not?

A. It might be daily, or at longer periods or shorter periods, depending on the circumstances of the case.

XQ. 174. And it would not be much of an added duty to that attendant to see that the mercury cups and the contacts of such a governor as the Lyndon governor are kept replenished with properly serviceable supplies of mercury, would it?

A. It would be no serious addition to the duties of such an attendant as you refer to. I would here point out, however, that not only must the cups be replenished, but the depth of the mercury in such cups must be maintained very accurately at the desired level; otherwise, the timing of the operations desired would be seriously interfered with.

XQ. 175. That is a matter of simple adjustment, the same as any other adjustment in lining up parts or maintaining proper relations?

A. It is.

XQ. 176. Have you ever, as I have previously inquired, employed glycerine floated upon the surface of mercury in contact cups?

A. I do not now recall that I have ever employed this particular substance. I have employed oils of varying specific gravities, closely approximating to glycerine in general physical characteristics.

XQ. 177. If the lights of the Lyndon Patent Model are responsive in their action to the movements of the sliding bar we have referred to, do they not indicate the conditions incident to governing in the same manner as if they were responsive to the movements of the core of the solenoid 33 of the Lyndon patent?

A. In my opinion they do not. The lighting of a red light implies simply that a certain contact has been made, and nothing more. In other words, the lighting of a red light is not in itself directly responsive to the speed changes, but simply results from the making of a contact, which contact is intended to bring into operation a series of events which will tend to control or correct the speed change.

XQ. 178. But does it make any difference whether this contact is made at a definite point in the movement of the solenoid core or at a definite point in the movement of such a sliding bar as we have referred to in the model, in so far as indicating

that there is a change in speed responsible for such definite movement?

A. In my opinion it does, since I have stated in my answer to the previous question that the lighting of the red light implies in itself no more than the making of a contact. It does not necessarily imply a change of speed.

XQ. 179. If the sliding bar is only moved when there is a change of speed, must not the lighting of the light only occur when there is a change of speed?

A. If we know, for example, as in the Lyndon Patent Model, that the movement of the bar will result in the making of a contact which will cause a light to show, and if we know, likewise, that the movement of said bar results from the movement of the hand-wheel and is co-incident with the movement of the belt shifter which will bring about a change of speed, then it is obvious that if these parts are simultaneously operative the lighting of the red light and the change of speed will likewise be simultaneous. But they will not stand in the relation of cause and effect.

XQ. 180. They will, however, stand in this latter relation in so far as movement of the bar corresponds to the movement of the solenoid core, considered independent of causation of such movement, will they not?

A. I cannot agree that in any sense of the term the lighting of the light and the change of speed can be said to stand in the relation of cause and effect.

XQ. 181. If the movement of the sliding bar be



coincident with a change of speed in the water-wheel model part in the Lyndon Patent Model, is it not proper to say that the lights will be lighted as indicative of that change of speed in the same manner as lights might similarly be lighted as indicative of a change of water-wheel speed, through the agency of the solenoid core in an apparatus constructed in accordance with the Lyndon patent?

A. The lights will be indicative of a change of speed in the sense which I have already described, namely, that with the various parts referred to in proper connection and fully operative, change of speed will be accompanied by a lighting of a light. I simply draw the distinction between two phenomena, one of which accompanies the other, not in causal relation, and two phenomena which will follow each other in direct causal relation, the latter as a sequence of the former.

XQ. 182. Do you consider it would be practical or feasible to reproduce within a court-room an entire representation of the Lyndon patent hydro-electric governor apparatus, with a waterwheel and a proper water-head, dynamo 8 and all the other features, and with a variable load condition upon the water-wheel?

A. It would certainly be possible, but such an attempt would be exceedingly difficult to carry out by reason of the expense which would be involved in the making of virtually a complete water-power unit and attached governor.

XQ. 183. And it might result, might it not, in an inundation of the court-room?

A. Such a result is entirely possible.

XQ. 184. It is perfectly possible, is it not, to control through a mechanical train the operation of certain features so as to get the same actions and movements as possible to obtain through an electro-mechanical train?

A. In many cases it is. It is, however, impossible to make any broad or sweeping statement in answer to such a question.

XQ. 185. Does not the speed-sensitive governor sense and ultimately translate into speed correction all of the factors acting collectively upon it so that a definite movement is produced—such as the movement of the core of the solenoid 33—and is it not possible to produce just such a movement voluntarily upon the sliding bar of the Lyndon Patent Model?

A. In my opinion it is not.

XQ. 186. Do not all of these factors unite together to produce one resultant effect upon the part, such as the core of the solenoid?

A. They do. They do in the sense that in answer to all the causes inter-acting to produce a change in the magnetic field of the solenoid the core will take a position of equilibrium with such change of field in connection with the various forces or agencies which oppose or tend to oppose its movement.

XQ. 187. And if, as I believe you have stated, you are able to simulate manually the movements of

the levers of the Lyndon Patent Model, can you not in the same sense simulate manually the movement of the core of the solenoid in manually operating the sliding bar?

A. A movement of the sliding bar in the model is unquestionably produced by the movement of the hand-wheel, and this initiates the train of corrective movements. To this extent it does simulate the movement of the core 34 which initiates a train of corrective movements. The time and force relations in the two cases, as well as the entire relation of these operations, to the problem of power-plant governing, is, however, profoundly and entirely different in the two cases.

XQ. 188. Do I understand you to signify that the hand cannot be trained to give the same movements to the sliding bar that the solenoid would give to its core?

A. As a matter of training, I do not believe that it could, although the distinction is perhaps one not of great importance.

XQ. 189. Does not the secondary belt-shifter of the Lyndon Patent Model act responsive to correction of the speed of the water-wheel model part in fair correspondence with the movement of the core of the Lyndon patent solenoid 34?

A. The movement of the secondary belt-shifter is immediately responsive to the train of operations initiated by the shaft corresponding to the drive-shaft 20, and this tends to control the movement of the water-gate. I cannot, however, find in this re-

lation any responsive or natural relation of the movement of the solenoid core 34 in the Lyndon patent specification.

XQ. 190. But when the shaft 20 as operated in the shifting of the gates, there is resultantly a movement of the core, is there not, referring to the patent?

A. A movement of the shaft 20 and the consequent movement of the gates results in change of speed of the wheel to which the armature core 34 is responsive.

XQ. 191. And the sliding bar in the model is responsive to a shifting of the secondary belt?

A. I should hardly be willing to say that the movement of the sliding bar is responsive to the movement of the secondary belt, but rather that the movement of the sliding bar results as a direct mechanical sequence of the movement of the secondary belt.

XQ. 192. Through the agency of the belt-shifter on the secondary belt?

A. Certainly.

XQ. 193. Electromechanical governing devices are in extensive use, the same including make and break contacts, in many arts, such as electrically controlled elevators and other devices in which there is a long continued service? Is that not so?

A. That is correct.

XQ. 194. And other instances of such use are railroad signalling systems and telegraphic system?



A. Unquestionably.

XQ. 195. Have you any objection to stating who furnished the other pair of hands which assisted yours in the manual operation of the several parts of the Lyndon Patent Model?

A. They were furnished by Mr. T. A. Panter, Assistant Engineer in the office of—I am not sure that I can give the official name of the office.

XQ. 196. Is he an electrical engineer?

A. Yes, sir. He is assistant electrical engineer in the office of the Los Angeles Aqueduct Power Bureau. I think that is the name of it.

XQ. 197. The speed of the water-wheel indicated, as connected with the Lyndon patent governor, is presumed to change definitely in step with the load imposed upon the wheel, is it not?

A. I should scarcely express the facts in that way. I should say that the change of speed from any condition of equilibrium results from a change in load and the resultant lack of equilibrium between the water supply and the new load. I should not care to say that this change takes place in step.

XQ. 198. Isn't it possible in the use of the Lyndon Patent Model to set up slight or great, slow or fast, speed change conditions pertaining to the water-wheel part of such model?

A. It is, as I have testified in my discussion of the operation of these elements.

XQ. 199. And that could be done manually in a hydro-electric plant utilizing the Lyndon water-

wheel governor by voluntarily changing the load upon the water-wheel, would it not?

A. The voluntary change of the load on the water-wheel would unquestionably result in consequent changes of speed.

XQ. 200. And that could be done, for instance, could it not, by varying the excitation of the field in the generator in such a plant by means of hand-operated rheostat or resistance device in the plant?

A. Unquestionably.

XQ. 201. And then you would have definite conditions produced affecting the water-wheel governor through manual or voluntary causation, would you not?

A. We should have definite changes of load produced through manual operation of the rheostat device to which you refer, as a consequence of which the speed of the wheel would change, followed by a movement of the speed-sensitive element in the governor and consequent corrective movements of the water-gate.

XQ. 202. Then could you not in the same degree in the Lyndon Patent Model change the position by hand of the controller bar as in a plant including the Lyndon governor you could change the position of the solenoid core by manually varying the excitation of the field of the generator along the lines you have just testified?

A. I have already testified to the fact that in the Lyndon Patent Model the movement of the bar representing the armature is, in fact, placed under

direct manual control, and the degree and character of such movement is thus under manual control except as such control is modified by the operation of return effected through the secondary belt shifter.

XQ. 203. I do not believe that takes both sides of the question.

A. I intended to answer it. (Question is read.) In my previous answer I stated specifically that the movement of the bar representing the armature core is placed under direct manual control, and by this I intended to imply that any desired movement of such bar could be produced except as such movement might be interfered with or modified by the return effected from the secondary belt. In the case of the Lyndon patent the chain of events contemplated is very much more complex and the movement of the solenoid core is related to the movement of the hand element of the rheostat through an entirely different chain of elements. In general, however, a movement would result in each consequent upon hand operation, in the one case the hand wheel on the model, and in the other case the hand element on the rheostat.

XQ. 204. And the degree can be made to correspond in both cases, can it not?

A. I should say that approximately the degrees in the two cases might be made to correspond, although it would be exceedingly difficult, in my opinion, to actually operate a rheostat in such manner as to produce with assurance any desired movement in the armature core 34 analogous to the stated

movement in the bar of the model which represents the armature core.

XQ. 205. But, knowing what the movement has been in the one case through the hand-control of the rheostat, would it not be possible to reproduce the same movement by hand in the model?

A. I think that with some skill in manipulating the Lyndon Patent Model such movement of the bar could be produced as would broadly correspond to the movement of the armature core to which you have referred, or, more specifically, with sufficient skill in the operation of the model any stated or desired movement of the bar might be produced within the limits imposed by the various connections.

XQ. 206. And assuming the same motions were produced in the sliding bar that were produced in the core of the solenoid, the same effects would be produced on the contacts at 40 41. Is that not correct?

A. I have already so testified in my discussion of the operation of these various elements.

Mr. Blakeslee: That is all.

#### REDIRECT EXAMINATION

By Mr. Westall:

RDQ. 207. Counsel has suggested during your cross-examination the substitution of knife switches upon the circuit supplied by the generator operated by the water-wheel associated with the governor. Please state whether or not the substitution of such knife switches would obviate the difficulties of the contacts which you have described?



Mr. Blakeslee: I do not believe that this reference to the record is correct. The testimony, I believe, referred to the introduction of knife switches in the circuit supplied by the plant and not the substitution of knife switches for any circuit makers or breakers in the plant or any part of the governing apparatus.

RDQ. 208. By Mr. Westall: Well, with the assumption that I have correctly interpreted the question, I will ask the witness to state whether or not the substitution of knife switches in any part of the device of the Lyndon patent in suit would be a feasible method of overcoming the difficulties which have been spoken of concerning other forms of contacts.

Mr. Blakeslee: Objected to as indefinite and calling for a conclusion and not for a statement of facts.

A. In my opinion they would not.

RDQ. 209. By Mr. Westall: Will you please briefly state your reasons?

A. For these reasons: that the operation of the contacts in the Lyndon patent specification depend upon the agency of relatively small forces, and involve careful adjustment of time and space relations. These conditions, especially as regards the forces involved, would not be as well made by the use of knife switches as by the use of the forms of contact indicated in the drawings accompanying the Lyndon Patent specification.

RDQ. 210. In one of your answers on cross-examination, if I understood you correctly, you stat-

ed that there was no place in the specification of the Lyndon patent in suit where the "returning device" is mentioned as rod 25. I will ask you to refer to line 13, page 2 of the specification, and also to line 23, page 2, and to state whether or not I have correctly understood your testimony.

Mr. Blakeslee: Objected to as not in accordance with the testimony of the witness.

A. I do not remember having made the statement to which you refer. A reference to the record will serve to show. But my recollection indicates to me that in this matter I referred specifically to the term "returning device" as referring specifically to the rod 25 and supported such conclusion by the several references to the language of the patent specification.

RDQ. 211. By Mr. Westall: Do you find anywhere in the Lyndon specification any suggestion or statement that might be interpreted to mean that Lyndon depended in any way upon slippage of any of the clutches, and, particularly, the clutch of 22 23, in order to assist in the operativeness of the device of the patent in suit?

A. I do not, as I have already testified in a previous reference to this matter.

RDQ. 212. Without considering particularly the language of the specification to determine the meaning of words used in the claims of the Lyndon patent, I will ask you if the word "controller" might not be as aptly applied to the dynamo 8 of the Lyndon patent as to any other part of the mechanism,

that is to say, using the term "controller" in its broad signification.

Mr. Blakeslee: Objected to as not redirect examination and as irrelevant, incompetent and immaterial, it being manifest that counsel is going beyond the subject before us, and the present witness is not here to expound the meanings of terms further than as employed in the special matter before us.

A. In a broad sense of the term and without reference to the language employed in the patent specification or claims, the dynamo 8 might properly enough be termed a controller, since its function as a controlling element or agent.

RDQ. 213. By Mr. Westall: In one of the questions on cross-examination you were asked whether there was a better definition of a controller than "that which serves to control." State whether or not such definition of controller would apply with as much force to dynamo 8 as to the solenoid 33 of the Lyndon patent in suit.

Mr. Blakeslee: The same objection as last noted.

A. In my opinion it would.

RDQ. 214. By Mr. Westall: Please state whether or not the Lyndon patent Model submitted in evidence in this case is a water-wheel governor.

Mr. Blakeslee: Objected to as calling for a conclusion on the part of the witness and not for a statement of facts, and as leading and not redirect examination.

A. It is not.

RDQ. 215. By Mr. Westall: Is it a working model of a water-wheel governor?

Mr. Blakeslee: The same objection.

A. It is not.

RDQ. 216. By Mr. Westall: Please give reasons for your last answer.

Mr. Blakeslee: The same objections.

A. It does not contain the two fundamental and essential elements of such a device, namely, a water-power unit responsive in speed to changes in load, and a speed-sensitive element responsive to such changes of speed, nor does it contain any equivalents therefore.

RDQ. 217. By Mr. Westall: Could a device such as is embodied in the Lyndon Patent Model referred to operate or function as a hydraulic power plant governor?

Mr. Blakeslee: The same objections.

A. It could not, for reasons which I have already stated.

RDQ. 218. By Mr. Westall: Could the operation of the Lyndon Patent Model as it now stands, and as submitted in evidence in this cause, give any conclusive evidence as to the operative possibility of any actual hydraulic power-plant governor possessing the connective parts of the model, but with a speed-sensitive device connected with the prime mover responsive to load changes, or substantially as completed in the Lyndon specifications?

Mr. Blakeslee: The same objections.

A. In my opinion it could not, since it does not



contain the two essential features of such a complete water power unit or equivalents as noted in my previous answer; and since in consequence the entire time, force and operative conditions are essentially different in the two cases. In this sense, therefore, I reach the conclusion that with reference to the operation of a complete power plant unit and governor the operation of the model as submitted is inconclusive and irrelevant.

### RECROSS EXAMINATION

By. Mr. Blakeslee:

RXQ. 219. The clutch 22 23 of the Lyndon patent is definitely a clutch of that type which will permit slip as between its members, it is not?

A. It is.

Mr. Blakeslee: That is all.

Mr. Blakeslee: At this point complainant renews his notice of motion to suppress and withhold from consideration the entire deposition of this witness just examined, on the principal ground that such deposition does not fall within the provisions of the order permitting surrebuttal procedure in this case, as more specifically urged upon the record from point to point thereof.

Mr. Westall: This concludes the surrebuttal proofs behalf of defendant.

UNITED STATES OF AMERICA, }

State of California,

County of Los Angeles.

~~SS.~~

I, I. BENJAMIN, Special Examiner, duly appointed and sworn in the case entitled "George J. Henry, Jr., Complainant, versus City of Los Angeles, Defendant, No. A-87, In Equity," do hereby certify that the foregoing transcript is a full, true and correct record of proofs adduced before me as such Special Examiner, and proceedings in connection therewith, to-wit; Proofs introduced by complainant in his prima facia case, proofs introduced by defendant, proofs in rebuttal introduced by complainant and proofs introduced by defendant in sur-rebuttal; except that pages 2024 to 2230, both inclusive, were taken by J. L. Holland, in San Francisco, in my absence pursuant to the terms of a stipulation entered into in writing by counsel for the respective parties, in which it was agreed that the testimony to be taken in said city of San Francisco could be taken before any reporter designated by me, and in pursuance of said stipulation, I designated the said J. L. Holland.

I further certify that the witnesses, whose testimony appears in the foregoing transcript, are named as follows:

**FOR COMPLAINANT:**

George J. Henry, Jr., E. F. Scattergood, C. A. Heinze, Alfred H. Daehler, Willis Gorman Dodd,

George Alexander, Leslie R. Hewitt, C. H. Hance, L. A. Handley, R. F. Del Valle, C. L. Cory.

FOR DEFENDANT:

Michael Kvapishevski, Edward S. Cobb, Peter H. Ducker, S. L. Berry, H. B. Fessenden, B. C. Van Emon, O. H. Ensign, J. A. Lighthipe, L. L. McAfee.

IN REBUTTAL:

W. W. Wilson, James F. Dearth, Charles B. Sessions, Carroll N. Beal, Rudolph Van Norden, M. C. McKay, Arthur H. Holloran, George J. Henry, Jr., Lamar Lyndon, C. L. Cory.

IN SUR-REBUTTAL:

William F. Durand.

I further certify that the said witnesses were severally by me duly sworn to testify the truth, the whole truth, and nothing but the truth, before giving their respective depositions.

I further certify that the proofs introduced by complainant, were begun on the 9th day of January 1914 and completed on the 16th day of February, 1914; that the proofs introduced on behalf of defendant, were begun on the 1st day of April, 1914 and completed on the 2nd day of July, 1914; that the complainant's proofs in rebuttal were begun on the 17th day of February, 1915 and completed on the 10th day of July, 1915; and that the defendant's proofs in sur-rebuttal were begun on the 25th day of August, 1915 and completed on the 26th day of August, 1915.

I further certify that the exhibits offered in evidence by both parties, were marked and identified by me as stated in the foregoing transcript, and the same are filed with the clerk, together with this transcript.

I also return and file herewith further certified record taken pursuant to stipulation and order of court, including depositions of Hillary C. Messimer, Earle A. Merrill, Henry C. Meyer, Jr., Thornburn Reid, Edward Lyndon, Marcellus Bailey, Thomas Shipley, Louis S. Morse, Theodore A. Stebbins, Robert A. Spangler, Earl W. Gardner, together with the exhibits offered in connection therewith.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 7th day of September, 1915.

(Signed) I. BENJAMIN,  
Special Examiner.

*Endorsement omitted.*



*In the District Court of the United States, in and  
for the Southern District of California, South-  
ern Division.*

No. A-87—EQUITY.

GEORGE J. HENRY, Jr.,

Plaintiff,

vs.

CITY OF LOS ANGELES,

Defendant.

**Certificate of Clerk U. S. District Court to  
Transcript of Record.**

I, Chas. N. Williams, Clerk of the United States District Court for the Southern District of California, do hereby certify the foregoing seven volumes, numbered from 1 to 7, inclusive, to be the transcript of record on appeal in the above-entitled cause, as printed by the appellant and presented to me for comparison and certification, and that the same as corrected by me, contains a full, true and correct copy of each of the following papers, viz., the Bill of Complaint, Answer of Defendant City of Los Angeles, Amended Answer of Defendant City of Los Angeles, Decree, Petition by the Pelton Water Wheel Company for Leave to Intervene, Amended Answer of the Pelton Water Wheel Company, Petition for Order Allowing Appeal, Order Allowing Appeal, Assign-

ment of Errors, Conclusions of the Court, Bond on Appeal, Praecept Under Rule 75, Order for Transmission of Exhibits to United States Circuit Court of Appeals, Stipulation as to Contents of Record, Stipulation to Include Stipulations in the Record, Minute Order Granting the Pelton Water Wheel Company Leave to Intervene, Stipulation Excluding the Intervenor as a Party, Minute Order Excluding the Intervenor the Pelton Water Wheel Company as a Party to said Suit; except that there is omitted from said papers the title of the court and cause and the endorsements including the notation of filing; said transcript as corrected by me also contains a full, true and correct copy of the testimony of the following witnesses as the same was filed in my office, viz.: George J. Henry, Jr., E. F. Scattergood, C. A. Heinze, C. L. Cory, Michael Kvapishevski, Edward S. Cobb, Peter H. Ducker, S. L. Berry, Edward B. Strong, B. C. Van Emon, O. H. Ensign, J. A. Lighthipe, L. L. McAfee, W. W. Wilson, James F. Dearth, Charles B. Sessions, Carrol N. Beal,

Rudolph W. Van Norden, Arthur H. Halloran, Lamar Lyndon, Thomas Shipley, Louis S. Morse, Marcellus Bailey, Hillary C. Messimer, Earle A. Merrill, Henry C. Meyer, Jr., Thorburn Reid, Edward Lyndon, Harry E. Knight and William F. Durand; except that there is omitted therefrom in various places the title of the court; title of the cause; statements as to adjournment, places of meeting, appearances, etc.; the notary's certificate to depositions; endorsements, including notation of filing; also a letter of which a notation by the Examiner appears at page 2515 of the printed record.

I do further certify that the fees of the clerk for comparing, correcting and certifying the foregoing record on appeal, amount to \$747.35, and that said amount has been paid me by appellant herein.

This certificate is not intended to apply to the orders extending time to file the record with the clerk of the Circuit Court of Appeals, as

the originals of said orders are not on file in my office.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seal of the District Court of the United States of America, in and for the Southern District of California, Southern Division, this 30th day of January, in the year of our Lord one thousand nine hundred and eighteen, and of our Independence the one hundred and forty-second.

[Seal]

CHAS. N. WILLIAMS,

Clerk of the District Court of the United States of America, in and for the Southern District of California.



No. 3108

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IN THE  
2

# United States Circuit Court of Appeals

NINTH JUDICIAL CIRCUIT

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GEO. J. HENRY, Jr.

Appellant

vs.

CITY OF LOS ANGELES,

Appellee

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***Appellant's Copies of Printed Exhibits***

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RAYMOND IVES BLAKESLEE,

Counsel for Appellant

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FILED

SEP 11 1918

# UNITED STATES PATENT OFFICE.

CARL S. ENGLISH, OF LOWELL, MICHIGAN, ASSIGNOR OF ONE-HALF TO  
CHARLES A. CHURCH AND OTTO C. McDANNELL, OF SAME PLACE.

## ELECTRICAL GOVERNOR FOR WATER-WHEELS.

SPECIFICATION forming part of Letters Patent No. 521,085, dated June 5, 1894.

Application filed December 23, 1893. Serial No. 494,599. (No model.)

*To all whom it may concern:*

Be it known that I, CARL S. ENGLISH, a citizen of the United States, residing at the village of Lowell, in the county of Kent and State of Michigan, have invented a certain new and useful Electrical Governor for Water-Wheels, of which the following is a specification.

This invention relates to a new and useful governor for water-wheels.

The invention has for its object to provide novel mechanism for automatically regulating the supply of water to a water wheel that is utilized to generate power for an electric dynamo, in such manner that the amount of water supplied to the wheel, and consequently the power developed by the wheel, shall be increased and diminished in proportion to the amount of work required to be performed by the dynamo, and to this end my invention consists in the novel construction, arrangement and combination of parts hereinafter fully described and afterward definitely pointed out in the claims following the description, reference being had to the accompanying drawing forming a part of this specification.

In the drawing I have shown in elevation a portion of the conductors used in connection with a dynamo, together with suitable mechanism for controlling secondary currents generated by means of a battery or other suitable electrical power, together with connecting mechanism for operating upon the shaft which controls the gate that allows the water to flow upon the water-wheel or water-motor.

I have not illustrated the dynamo nor the water-wheel, for the reason that I make no claim to the form or shape of the dynamo or water-wheel, it being well understood that any form of gate or gates may be used for the purpose. I have also shown my preferred form of applying power, but it will be evident that various changes of form may be used without departing from the spirit of the invention.

In the drawing Z, represents a coil composed of a coarse wire and a fine wire, the coarser coil wires being shown by S, and the finer one by n. The object of using the coarse and fine wires is for the purpose of obtaining

a more accurate adjustment, as hereinafter more fully described.

i represents the needle or arm which is acted upon by the magnetic influence of the coil Z. The arm i, is pivoted at 2, and is provided with projections 3 and 4, which projections are adapted to come in contact with the contact points C' and C'', in order to connect the electric circuit, as hereinafter described. By winding the needle i, with a suitable wire coil, it is made an electro-magnet, and the current of electricity in coil S, will greatly increase the force or influence upon needle i when so wound either to repel or retract the same, depending upon the manner of winding the coil, as is well understood.

L' is a swinging lever or arm, which may also be pivoted at 2.

C is a cable or flexible connection which attaches the lower end of the lever L', to the axle or hub of the wheel P'', and also projects over the wheel 11, and supports the weight W.

B represents an electric battery, or any well-known means for generating a current of electricity.

B' is a conductor connecting the arm i, to the junction 5; 5 being the junction between the coils of the electro-magnets M and M'.

6 is a return wire from the electro-magnet M', and 7 is a return wire from the electro-magnet M.

M and M' represent electro-magnets, each wound with coils, as shown. These electro-magnets may be constructed in any well-known form.

8 is a shaft for the friction gear-wheel F. The friction wheel F is provided with two friction surfaces or disks 9 and 10, and the friction wheel F is supported upon the shaft 8 by means of a key or spline which will allow F to have a longitudinal movement upon the shaft 8, but compel it always to revolve with the shaft.

G and G' are gearings whereby the movement of the shaft 8 is conveyed to the shaft a. The shaft a extends downward, and is connected in any suitable manner with the gate so that the revolution of the shaft a in one direction opens the gate, and a counter



revolution shuts the gate. Any suitable attachment for opening and shutting the gate may be applied to the lower end of the shaft *a*.

11 is a hand-wheel by means of which the shaft *a* may be operated by hand should the user ever so desire to operate it. The hand-wheel 11 may be dispensed with, however, without interfering with the operation of my invention.

12 is a belt connecting shaft *a* to belt pulley *P*<sup>2</sup>, which belt pulley is provided with a hub 15 upon which the flexible connection *C* is adapted to wind, as hereinafter described.

13 is the journal of the band wheel *P*<sup>2</sup>, which journal *b* may be supported in any suitable bearings. It is immaterial whether the journal *b* revolves with the band pulley, or whether the band pulley revolves upon the journal.

14 In the drawing I have shown a bell *b* operated directly from the shaft *a*, but it is evident that the band wheel may be applied upon the shaft *a*, if desired.

15 *W* is a counter-weight adapted to return the lever *L*' to its normal position as the flexible connection *C* is unwound from the hub 15.

16 *P* is a pulley upon a suitable shaft which is revolved by any suitable machinery. Upon the same shaft is also the friction pulley *P*<sup>1</sup>.

17 *P* and *P*<sup>1</sup> are rigid with the same shaft, and when *P*<sup>1</sup> is brought in contact with the friction surface 9, it revolves the friction wheel *F*, in one direction, and when brought in contact with the friction surface 10, it revolves the wheel *F*, in another direction. The shifting of the wheel *F*, however, brings the friction surfaces alternately into contact with the pulley *P*<sup>1</sup>, the pulley *P*<sup>1</sup> having no shifting movement.

18 *L* is a lever armature adapted to turn upon the pivot *O*, as a fulcrum. What is shown to be the upper end of the lever *L*, engages with the circular groove 14, in the hub *F*, while the lower end of *L* acts as an armature for magnets *M* and *M*<sup>1</sup>.

19 *W*<sup>1</sup> is an adjusting weight placed upon an arm and preferably raised above the pivotal attaching point of the arm *i*. This weight *W*<sup>1</sup> is provided with a set-screw so that it may be raised and lowered and attached at any required point.

20 *W*<sup>2</sup> is an adjusting weight upon the arm *i*, which may be adjusted by means of a set-screw, or otherwise, to any required point.

21 12 represents the point of attachment for the flexible connection *C*, to the lower end of the lever *L*<sup>1</sup>.

I have described a connection between the arm *i*, and the operating parts which raise and lower the water-gate by means of a secondary battery *B*, and electro-magnets *M*<sup>1</sup> and *M*, which connection I deem to be the preferable form, but I do not wish to limit my invention to this form of connection; for the reason that the connection may be made directly between the arm *i*, and the mechanism which operates the shaft *a*, which shaft

*a*, may be properly termed the gate-stem, in which case the secondary battery *B*, and magnets might be dispensed with, and the power derived from the electro-magnetic influence of the coil *Z*, be made to operate the opening and closing of the gate.

In the example of my invention shown and described in the drawing, the operation is as follows: When the electric current from the dynamo passes through the coil *S*, the arm *i*, is drawn into the coil *S*, until the projection 3, comes in contact with the tangent point *C*<sup>1</sup>.

This allows the electric current from the battery *B*, to flow through the junction 5, through the coil wound around the magnet *M*<sup>1</sup>, and thence back through the connection 6, across the contacts and back through *B*<sup>1</sup> to the battery, thus energizing the magnet *M*<sup>1</sup>, and moving the armature or lower end of the lever *L*, toward its contact point with the magnet *M*<sup>1</sup>.

*L* turning upon the pivot *O*, as a fulcrum moves the friction wheel *F*, on its shaft 8, until friction surface 10 comes in contact with *P*<sup>1</sup>, the pulley *P*<sup>1</sup> revolving, then gives a revolving motion to *F*, and also conveys that revolution through gear-wheels *G* and *G*<sup>1</sup>, to the shaft *a*, and the shaft *a*, being connected to the water-wheel, raises the gate, increasing the flow of water and thereby the amount of electricity generated by the dynamo up to the required amount. The belt *b*, revolves the pulley *P*<sup>2</sup>, winding up the flexible connection *C*, its axle 15, drawing the lower end of the lever *L*<sup>1</sup>, toward shaft *a*, thereby breaking the contact between *C*<sup>1</sup>, and the projection 3.

This will check the further opening of the gate at the point where the water, admitted upon the wheel or motor, is just sufficient to carry the required load or to impart the required energy to the dynamo. The breaking point should be where the arm or needle *i*, balances with relation to the coil *S*. If the current through the coil *S*, becomes too much weakened, the arm *i*, will swing back and projection 4, will come in contact with *C*<sup>2</sup>, which will cause the electric current from the battery *B*, to circulate through the coil of magnet *M*, connecting conductor 7, thereby connecting points *C*<sup>2</sup> and 4, and connecting conductor *B*<sup>1</sup>, back to the battery *B*. This will draw the armature *L*, toward the electro-magnet *M*, turning the armature lever *L*<sup>1</sup>, on its fulcrum *O*, moving the friction wheel *F*, until friction surface 9, comes in contact with *P*<sup>1</sup>; *P*<sup>1</sup> revolving as above described will give a reverse action to the friction wheel *F*, and consequently through *F*, to shaft 8, gears *G* and *G*<sup>1</sup> and the shaft *a*, thereby reversing all the operating parts and shutting off the water from the water-wheel or motor so that only a proper amount of water will flow upon the wheel in order to carry the required load. It will be understood that the winding may be such that the action will be reversed, and the connection such that the reverse action will open the gate. Thus, the water supply for the wheel is always perfectly gaged by means



of the magnetic energy exerted through the coil Z, to the swinging arm or needle *i*. In case a heavy load is put upon the circuit suddenly, a slight lagging of speed sometimes happens, thus lowering the voltage of the current and lessening the amount of current which flows through the coil *n*. This allows the arm or needle *i*, to go farther into the coil or to swing farther toward the attracting point and thus opening the gate a little farther before the contacts break. This brings the speed quickly back to its normal position and corrects the voltage of the current. This is found desirable for the reason that water does not move as quickly or readily as steam or air, it having greater specific gravity and greater momentum. If the current is in large volume thrown off, a slight increase in speed and voltage may occur, thus increasing the current in coil *n*, thereby allowing the arm or needle *i*, to withdraw farther out of the coil than it would normally, thus closing the gate more than it would normally and thereby lowering the voltage to the proper point. In case the needle *i*, is so wound as to be repelled, the repulsion or reverse action of *i*, will produce the result last above described.

I have shown what I deem to be the most preferable method of applying the electro-magnetic force, generated by the electric current passing through the connections, from the dynamo, but any other suitable form may be applied, it being well-known that a current of electricity passing through any conductor will produce this electro-magnetic power, which power I desire to utilize for the purpose hereinafter specified.

Having thus described my invention, what I claim to have invented and desire to secure by Letters Patent, is—

1. In an electrical water wheel governor, the combination of the dynamo conductor having a coil S, a pivoted arm or needle carrying two contacts, a pivoted oscillating arm carrying contacts adapted to engage the contacts carried by said arm or needle, suitable connections between said oscillating arm and the water wheel gate, a circuit breaking device actuated by the movement of the gate mechanism, and means for actuating the gate operating mechanism, substantially as described.

2. The combination of the coil S, and the coil *n*, a needle *i*, suitable connections between said needle and the gate of the water-wheel whereby the flow of water is automatically controlled through the magnetic energy exerted from the dynamo connections, substantially as described.

3. The combination of the coils S and *n*, the needle *i*, the swinging lever L', the flexible connection C, pulley P<sup>2</sup> with its hub 15, the weight W, a battery, electro-magnets, conductors connecting said magnets and battery, circuit closing devices actuated by the needle for closing the circuit through either of said magnets, an armature actuated by said magnets, and gearing for actuating a water gate controlled by said armature, substantially as described.

4. The combination of the coils S and *n*, the needle provided with contact points for opening and closing the electric current, the battery B, the electro-magnets M' and M, suitable coils thereon, connections between such coils and the battery, an armature as 11, shifting device as F, provided with friction disks 9 and 10, revolving pulley P', and suitable mechanism connecting the shaft of F to the water-wheel, substantially as described.

5. The combination of the coil of the dynamo, a needle turning upon a pivot having contact points adapted to open and close an electric current, a battery as B, electro-magnets as M, M', suitable conductors extending from said electro-magnets to said battery whereby the current may be directed through either one or the other of said electro-magnets at pleasure, a lever armature as 11, a shifting mechanism as F, operated by means of a pulley as P, suitable mechanism connecting said shifting mechanism F, with the gate of the water-wheel, a band as *b*, pulley P<sup>2</sup>, lever L, flexible connection C and weight W, all constructed substantially as and for the purpose described.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

CARL S. ENGLISH. [L. S.]

Witnesses:

EDWARD TAGGART,  
CHRISTOPHER HONDELINK.



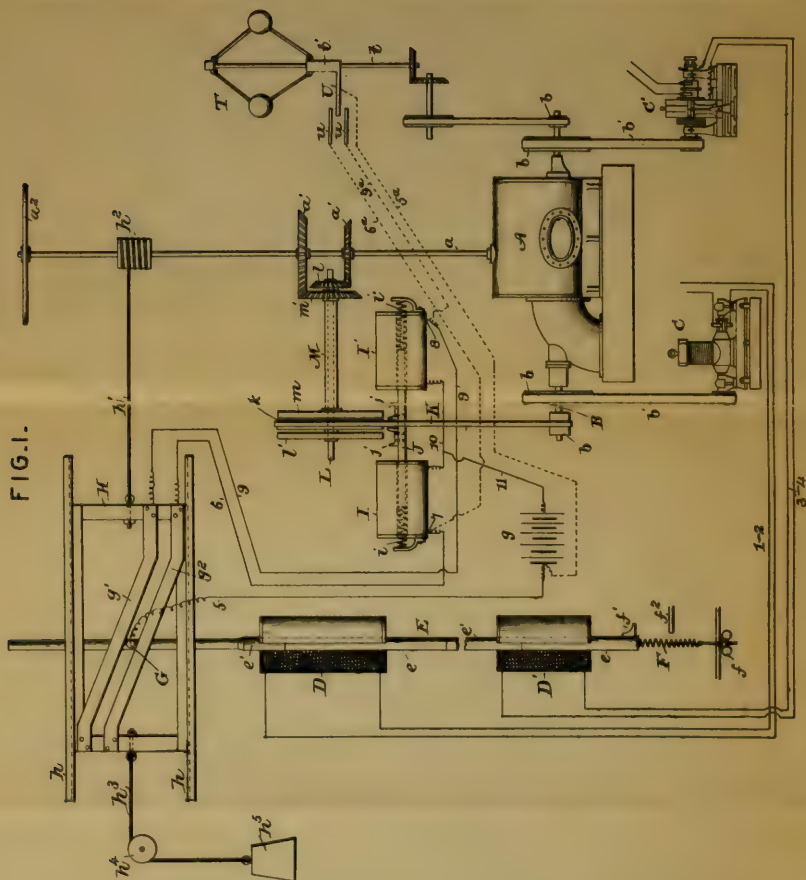
(No Model.)

2 Sheets—Sheet 1.

E. P. WETMORE.  
ELECTRICAL WATER WHEEL GOVERNOR.

No. 519,597.

Patented May 8, 1894.



Inventor

Earl P. Wetmore

Witnesses

Jas. H. McArthur  
S. P. McArthur

By His Attorneys.

Cathow & Co.



# UNITED STATES PATENT OFFICE.

EARL PORTER WETMORE, OF HELENA, MONTANA.

## ELECTRICAL WATER-WHEEL GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 519,597, dated May 8, 1894.

Application filed January 16, 1894. Serial No. 497,083. (No model.)

*To all whom it may concern:*

Be it known that I, EARL PORTER WETMORE, a citizen of the United States, residing at Helena, in the county of Lewis and Clarke and State of Montana, have invented a new and useful Electrical Water-Wheel Governor, of which the following is a specification.

This invention relates to electrical water wheel governors; and it has for its object to provide improved governing devices of this character which shall automatically operate to control the speed of a water wheel according to the load upon the dynamo or dynamos in circuit with the governor, or more technically speaking, according to the variations in current strength or in the output of such dynamos.

The main object of the present invention, therefore, is to regulate the effective supply of water to the water wheel or wheels through means of valves, gates or deflecting nozzles, which are directly controlled by the change in the output of electric energy from the dynamos which are operated by the water wheel or wheels, in order to admit or cut off the supply of water in direct proportion to the increase or decrease of the load upon the electric generators.

It is well known, that where the fly ball or centrifugal governors, or differential speed governors, are used in connection with water wheels of the governor does not become effective until the speed of the water wheels is changed. This change of speed in the water wheels is directly caused by the change of load upon the dynamos, and this invention therefore prevents loss of time in effecting the regulation, inasmuch as the change of load upon the dynamos puts the governing devices herein described into practical operation.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a diagrammatic plan view of an electrical water wheel governor constructed in accordance with this invention. Fig. 2 is a detail elevation partly in section of electric clutches

preferably used in connection with the apparatus shown in Fig. 1. Fig. 3 is a detail sectional view on the line  $x-x$  of Fig. 2. Fig. 4 is a detail view showing a preferred construction of contact device.

Referring to the accompanying drawings, A represents a single or double turbine water wheel, or reacting wheel of the Pelton or other type. This water wheel, as stated, is of any preferred construction, and the valve or gate mechanism thereof is controlled by means of the vertical valve rod or shaft  $a$ , which is provided at an intermediate point with reversely disposed beveled gear wheels  $a'$ , and carries at its upper end a hand wheel  $a''$ , which is ordinarily employed for controlling the flow of water through the wheel by hand, but in the present invention such rod is controlled automatically by the devices to be hereinafter described.

The shaft B, of the water wheel A, carries outside of the water wheel casing, any number of belt pulleys  $b$ , depending upon the number of electrical generators or dynamos driven by such water wheel, but as illustrated in Fig. 1 of the drawings, two of said belt pulleys receive the dynamo belts  $b'$ , which are belted to dynamos C and C', of any type or construction, the dynamo C, being illustrated as a direct current dynamo, while the dynamo C', is of the alternating type, and it is to be understood that any number of dynamos of any type may be employed. The direct current dynamo C, is connected in series, by the series circuit 1—2 with a suitably arranged solenoid D, while the alternating dynamo C', has the compound field winding thereof connected in series with the solenoid D', by the series circuit 3—4.

The solenoid D, is illustrated as being arranged directly above and in line with the solenoid D', and it will of course be understood that the specific character of the winding of said solenoids depends upon the fact whether each is connected with one or more dynamos and of the character of such dynamos. Should one or more of the dynamos operated by the water wheel be of the polyphase type, then the magnet D, would be included in series with the field circuit of the polyphase current dynamo, that is, the entire exciting current would pass through the magnet



D, and regulation would be effected since the exciting current of a polyphase generator varies in a certain ratio to the load upon the dynamos. In case one or more of the dynamos operated by the water wheels is of an arc or constant current type, then the magnets D or D', would be made up of one or more sections of fine wire of proper resistance to enable the same to be connected directly across the terminals of the arc or constant current dynamo. These changes in the windings will of course be varied to accommodate the apparatus to the different dynamos, but only to secure the same result in connection with such dynamos as those illustrated in the drawings, and the aligned solenoids or magnets D, and D', accommodate therein the sectional core plunger E. The sectional core plunger E, is made up of connecting magnetic metallic sections  $e$ , and non-magnetic metallic sections  $e'$ , which form together a single continuous core plunger, but it will of course be understood that the magnetic metallic portions  $e$ , of the core, are adapted to move within the solenoids, so that motion will be given to the core plunger in either direction, as such solenoids become energized or de-energized. The core plunger E, has connected with the lower end thereof the adjusting spring F, adjustably connected at  $f$ , to a suitable point of attachment, so that the core plunger will always be returned to its normal inactive position after either or both of the solenoids have become inactive, and said core plunger is further provided at its lower extremity with an off-standing stop arm  $f'$ , which is adapted to come in contact with an off-standing stop projection  $f''$ , which provides a limit to the downward movement of the plunger. As the said core plunger E, is moved in either direction according to the variation in the strength of either or both of the solenoids, as the load upon the dynamos connected therewith increases or decreases, such core plunger is adapted to act as a circuit closer for the valve or gate operating devices to be described, and is provided at a suitable point above the upper solenoid D, with a contact pin or roller G, which is electrically connected by the wire 5, with one pole of a convenient source of electrical energy  $g$ , which may be a suitable series of batteries or a dynamo. The contact point or roller G, carried by the solenoid-controlled core plunger E, is adapted to play between the approximately parallel contact plates  $g'$ , and  $g''$ , respectively. The contact plates  $g'$  and  $g''$ , are mounted in substantially parallel planes and at an angle on the sliding contact frame H. The sliding contact frame H, is mounted to slide between the parallel guides or ways  $h$ , and has attached to one end the adjusting rope  $h'$ , which winds and unwinds on the grooved rope drum  $h''$ , secured on the valve rod  $a$ , while to the other end of the sliding frame H, is attached one end of the weight rope  $h^3$ , which passes over a suitably arranged guide pulley  $h^4$ , and has

attached to the free end a weight  $h^5$ , which serves to slide the contact frame in one direction. The movement of the core plunger E, is adapted to bring the contact pin or roller G, in contact with either of the plates  $g'$  or  $g''$ , and complete a circuit through the external source of electrical energy  $g$ , and to provide for this, the contact plate  $g''$ , is electrically connected by the wire 6, to one terminal 7, of a suitably arranged solenoid I, directly in a line with which, and opposite to, is arranged a duplicate solenoid I', one terminal 8, of which is connected by the wire 9, to the other contact plate  $g'$ , while the adjacent terminals of these two solenoids I and I', are joined by the bridge wire 10, which has connected thereto the circuit return wire 11, leading to the other pole of the external source of electrical energy  $g$ , and thereby providing for a completion of the external circuit through either of the magnets I and I', according as the contact pin or roller G, is moved in contact with either of the contact plates  $g'$ , or  $g''$ , mounted on the sliding frame H. The aligned solenoids I and I', are adapted to control, in either direction, the movement of a horizontally moving core J, the ends of which slide in the opposite solenoids, and within the open outer ends of the solenoids I, and I', are arranged the core adjusting springs  $i$  and  $i'$ , which have one end thereof bearing on the extremities of the core J, and are of a tension which holds the said core to a normal inactive position. The horizontally moving core J, carries at a point between the inner adjacent ends of the solenoids I and I', the parallel shifting lugs or tappets  $j$ , which embrace a belt K, driven from one of the pulleys  $b$ , of the water wheel shaft, and passing over a loose pulley  $k$ , mounted loosely on a suitably supported and arranged regulating shaft L, which carries at one end a pinion  $l$ , meshing with the lower one of the wheels  $a'$ , and adapted to turn such wheel in a direction to close or cut off the supply of water controlled by the rod  $a$ . The shaft L, carries at a point alongside of the intermediate loose pulley  $k$ , a fast pulley  $l'$ , onto which the belt is adapted to be moved by the magnet shifting devices when the core J, is shifted in one direction. At the opposite side of the pulley  $k$ , and loosely mounted on the shaft L, is the sleeve M, carrying at one end alongside of the loose pulley a belt wheel  $m$ , and at its opposite extremity a beveled gear wheel  $m'$ , which meshes with the upper one of the beveled gear wheels  $a'$ , and is adapted to turn the valve or gate regulating rod  $a$ , in a direction to open the valve or gate of the water wheel.

The operation of the apparatus set up as just described is as follows:—Assuming direct current and alternating dynamos C and C', are in operation from the water wheel A, a sudden increase of current load on the direct current dynamo C will energize the solenoid D, sufficiently, so as to move the core plunger E, upward, against the tension of the



spring F, and cause the contact pin or roller G, to contact with the upper metallic contact plate  $g'$ , on the sliding frame. The circuit is then completed through the wire 5, from the external source of generation  $g$ , the contact plate  $g'$ , wire 9, solenoid I, and the return wire 11, which circuit energizes the solenoid I', and moves the shifting core J, in a direction which shifts the belt K, from the loose pulley,  $k$ , onto the sleeve pulley  $m$ , which immediately operates the gear  $m'$ , and the upper one of the rod gears  $a'$ , so as to immediately increase the supply of water. As soon as the valve rod or shaft  $a$ , commences to turn, the adjusting rope  $h'$  winds on the drum  $h^2$ , and draws the frame II, in one direction until such frame has moved sufficiently far to relieve the contact G, from the upper contact plate  $g'$ . The current is thus automatically broken so as to de-energize the magnet I', and then the spring  $i'$ , immediately moves the core J, into a normal position and shifts the belt K, back onto the loose pulley. The two contact strips or plates  $g'$  and  $g^2$ , and the drum  $h^2$ , are so adjusted that the valves or gates are opened a proper amount to admit the required water for the operation of the wheels when the contact G touches neither of such plates, and therefore the distance or space between such contact plates determines the sensitiveness of the governor or regulator. It will be obvious that similar increases on the load of the alternator C', would have a similar effect on the solenoid or magnet D', to secure the same regulation just described; while, conversely, a decrease in the load of either dynamo would have the opposite effect, that is, to decrease the supply of water to the water wheel, in such case the sliding frame H, being moved properly in one direction by the weighted rope  $h^3$ .

While I have illustrated and described a belt shifting device which controls the separate gears engaging the gears on the valve rod or shaft, I preferably substitute these devices by the clutch devices or clutch wheels shown in Figs. 2 and 3 of the drawings. In Fig. 2, the shaft L, carries the gear L, at one end, and the shaft sleeve M, carries the gear  $m'$ , at one end in the same arrangement as described in connection with the belt shifting devices, but in the preferred arrangement, the shaft L, accommodates thereon a drive sleeve N, to which is keyed a belt wheel  $n$ , driven by the belt K, and to the opposite extremities of this sleeve are secured the metallic cup disks O, inside of which are adapted to turn the magnet wheels P. One of the magnet wheels P, is fastened to the shaft L, and the other of such wheels is fastened to one end of the sleeve M, in a similar manner to the mounting of the pulleys  $l'$  and  $m$ . Both of said magnet wheels P, are sectional and each is provided with a circumferential series of projecting pole pieces Q, adapted to align with similar inwardly projecting pole projections  $q$ , formed on the inner periphery

of the cup disks. At one side of each magnet wheel and inside of the circle of the pole pieces such magnet wheels are provided with the coil recesses  $q'$  in which are placed the magnet coils R, secured in position by the cap plates  $r$ , having inner recessed edges  $r'$ , forming a portion of the coil recesses. The terminals of the magnet coils R, lead respectively to collecting and discharging rings S, arranged at one side of the said magnet wheels. The same wire connections are employed in connection with the clutch wheels just described as in connection with the solenoids I and I', the wire 6 from the plate  $g^2$ , leading to the collecting ring of one magnet wheel, the wire 9, from the plate  $g'$ , leading to the collecting ring of the other magnet wheel, the bridge wire 10, connecting the discharging rings of both magnet wheels, and the return wire 11 connected to the bridge wire 10.

When the circuit is closed by the moving contact G, in the manner already described with either one of the contact plates on the sliding frame, either one or the other of the magnet wheels is energized so that the poles thereof are alternately north and south, and necessarily hold the pole projections  $q$ , magnetically attracted thereby, so that as the sleeve N, rotates, and turns the cup disks, the energized magnet wheel will be caused to revolve and turn the beveled gear wheel connected therewith, in a similar manner to the belt shifting operation already described.

In connection with the belt shifting or clutch wheel devices just described, I may employ an ordinary centrifugal or fly-ball governor T, the shaft  $t$ , of which is geared with and driven from the water wheel shaft B, and the sliding collar  $t'$ , which is moved up and down by the balls, is provided with a moving contact arm U, corresponding to the contact G and connected by the dotted wire 5 $^2$ , with one pole of the generator  $g$ . The moving contact U, is arranged to play between the separate contacts  $u$ , corresponding to the plates  $g'$ , and  $g^2$ , and are connected by the wires 6 $^2$ , and 9 $^2$ , with the same connections as the wires 6 and 9. The moving of the contact U, in contact with either one of the contacts  $u$ , secures the same operation from the belt shifting devices or clutch wheels as previously described.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention, and at this point attention is directed to the fact that in the foregoing description I have shown and described the frame H, upon which the contact strips  $g'$  and  $g^2$ , are located and which is suitably controlled by the drum  $h^2$ , rope and counterweight, for simplicity in explaining the operation of the apparatus, but ordinarily and preferably the contact strips  $g'$ , and  $g^2$ , would be arranged in the same relation to each other upon a drum or cylindrical frame X, mounted di-



rectly upon the shaft  $a$ , of the valve or gate mechanism as clearly shown in Fig. 4, of the drawings, thereby avoiding the use of the connecting devices.

5 By reference to Fig. 4, it will be seen that the contact plates which are lettered  $G'$  and  $G^2$ , to correspond with those on the sliding frame H, are arranged spirally on the cylindrical frame X, and are disposed parallel with  
10 each other so as to correspond in every particular to the relative arrangement of the plates  $g'$  and  $g^2$ , on the said sliding frame so that the same operation will be effected as the contact pin or roller G, is moved against  
15 either of the plates by the core, plunger, or armature E. The same circuit connections are observed in this preferable form of contact device it being shown that the wire 5, is connected to the contact G, the wire 6, to the  
20 contact plate  $G^2$ , and the wire 9, to the plate  $G'$ , and it is thought that the operation of this construction will be readily apparent without further description.

Having thus described the invention, what  
25 is claimed, and desired to be secured by Letters Patent, is—

1. In an electrical water wheel governor, the combination with the water wheel, the water wheel valve rod or shaft, and the dy-  
30 namo driven by the water wheel; of electrically controlled gear devices connected with the valve rod or shaft, an automatically moving contact frame controlled by the movements of the valve rod or shaft and carrying  
35 spaced contact plates in circuit with said gear devices, a solenoid included in the dynamo circuit, a core, plunger, or armature controlled by the solenoid and having a contact arranged to move between said contact plates, and an  
40 external source of electrical energy included in a circuit with said contact and said electrically controlled gear devices, substantially as set forth.

2. The combination with a prime mover, its  
45 valve or regulating mechanism and the dynamos driven by the prime mover; of electrically controlled gear devices connected with the valve or regulating mechanism and in circuit with an external source of electrical en-  
50 ergy, an automatically moving contact frame carrying spaced contact plates in circuit with said gear devices, solenoids circuited with the dynamos, a core, plunger or armature controlled by said solenoids and provided with a  
55 contact point or roller playing between the contact plates and also connected with said external source of electrical energy, substantially as set forth.

3. In an electrical water wheel governor, the  
60 combination with the water wheel valve rod or shaft; of electric motor device geared to said shaft to turn the same in either direction and included in a circuit with an external source of electrical energy, an automati-  
65 cally turning frame or cylinder carrying spaced contact plates arranged at an angle and separately connected by wires with said

motor devices, and an automatically controlled contact point or roller playing between said contact plates and electrically connected  
70 with a convenient external source of electrical energy, substantially as set forth.

4. In an apparatus of the class described, the combination with the electrically controlled gearing devices, a similarly controlled  
75 moving contact included in the circuit of said devices, and an external source of electrical energy; of a prime mover valve shaft or rod geared to said gear devices, a drum or cylinder mounted on said shaft or rod and turning  
80 therewith, and parallel contact plates secured spirally on said drum and adapted to have said moving contact play there-between, substantially as set forth.

5. In an electrical water wheel governor, the  
85 combination with the water wheel, its valve mechanism and the dynamo driven by the water wheel; of electrically controlled gear devices connected with the valve mechanism, spaced contact plates suitably arranged and  
90 controlled by the movement of the valve mechanism shaft, a solenoid included in the dynamo circuit, a core, plunger, or armature, controlled by said solenoid and having a contact moving between said contact plates, and  
95 an external source of electrical energy included in a circuit with said contact and the valve controlling devices, substantially as set forth.

6. In an electrical water wheel governor, the  
100 combination with the water wheel, its valve or gate mechanism, electric motor devices geared with said valve or gate mechanism, automatic circuit devices having a moving contact, and controlled by the dynamos  
105 driven by the wheels; of suitably arranged solenoids circuited separately with a dynamo and energized and de-energized according to the fluctuations in current strength generated thereby, and a sectional core plunger, having  
110 magnetic metallic portions moving in each of the solenoids and connected to and controlling the moving contact of the circuit closing device, substantially as set forth.

7. In an electrical water wheel governor, the  
115 combination with the water wheel, its valve or gate mechanism and the dynamos driven thereby; of electric motor devices geared with said valve or gate mechanism and included in the circuit of the external source of elec-  
120 trical energy, a drum or cylindrical frame mounted on the shaft of the valve mechanism, parallel contact plates mounted on said drum or frame and separately connected to reverse operating portions of said electric motor de-  
125 vices, electrically aligned solenoids circuited separately with the dynamos driven by the water wheel, and a core plunger moving in said aligned solenoids and having a contact playing between said contact plates and elec-  
130 trically connected with the external source of electrical energy, substantially as set forth.

8. In an electrical water wheel governor, the combination with the water wheel valve rod



or shaft having reversely disposed gear wheels, separate shafts having gear-wheels meshing respectively with different ones of the gears on the valve rod or shaft, electro-magnetic clutches or clutch wheels mounted  
5 on said separate shafts, and electrically controlled circuit closing devices included in separate circuits with said clutches or wheels to energize the same separately, substantially  
10 as set forth.

6. In an electric water wheel governor, the water wheel valve rod or shaft having reversely disposed gear wheels, a suitably arranged shaft carrying at one end a gear wheel  
15 meshing with one of the wheels on the rod or shaft, a shaft sleeve mounted on one end of said suitably arranged shaft and carrying on one end a gear wheel meshing with the other one of the wheels on the valve rod or shaft,  
20 magnet wheels mounted on said suitably arranged shaft and on one end of the shaft sleeve, a drive sleeve mounted on said suitably arranged shaft and driven from the water wheel, metallic cup disks secured on the

ends of said drive sleeve and surrounding 25 the magnet wheels, electrically controlled circuit closing devices, and separate circuit connections from the circuit closing devices to each of the magnet wheels to energize the same separately, substantially as set forth. 30

10. In an apparatus of the class described, the combination with the separate shafts; of a metallic cup disk mounted on one of said shafts, a magnet wheel mounted on the other one of the shafts inside of the cup disk and 35 having a circumferential series of projecting pole pieces and an energizing magnet coil clamped inside of the same and inside of the circle of the pole pieces, and suitable circuit connections with the magnet coil, substan- 40 tially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EARL PORTER WETMORE.

Witnesses:

H. S. HEPNER,

C. H. ALEXANDER.

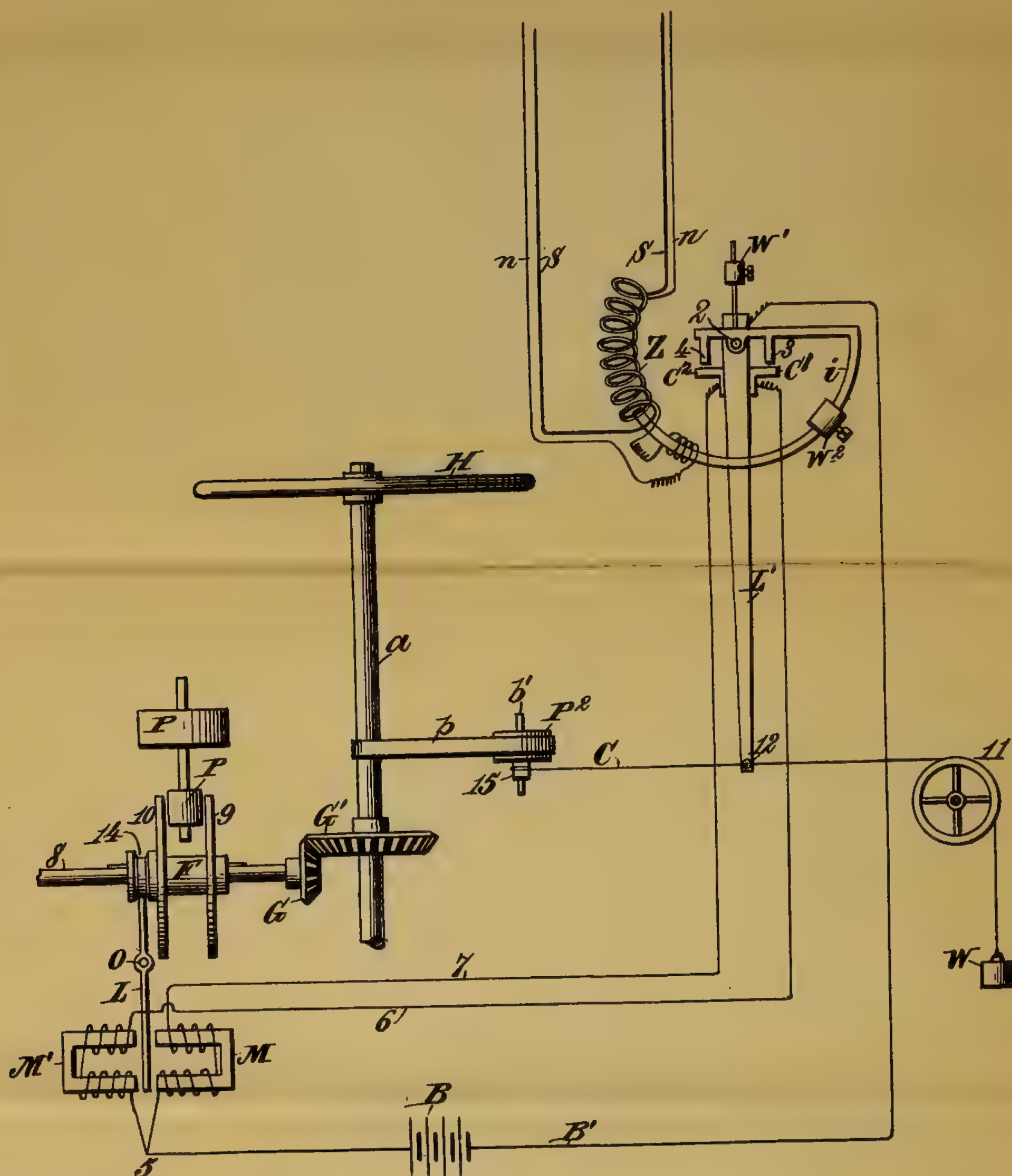
(No Model.)

C. S. ENGLISH.

ELECTRICAL GOVERNOR FOR WATER WHEELS.

No. 521,085.

Patented June 5, 1894.



Witnesses.  
Chas Everett.

G. W. Rea.

*Inventor:*  
*Carl S. English.*  
*By*  
*Edward Tappan.*  
*Atty.*



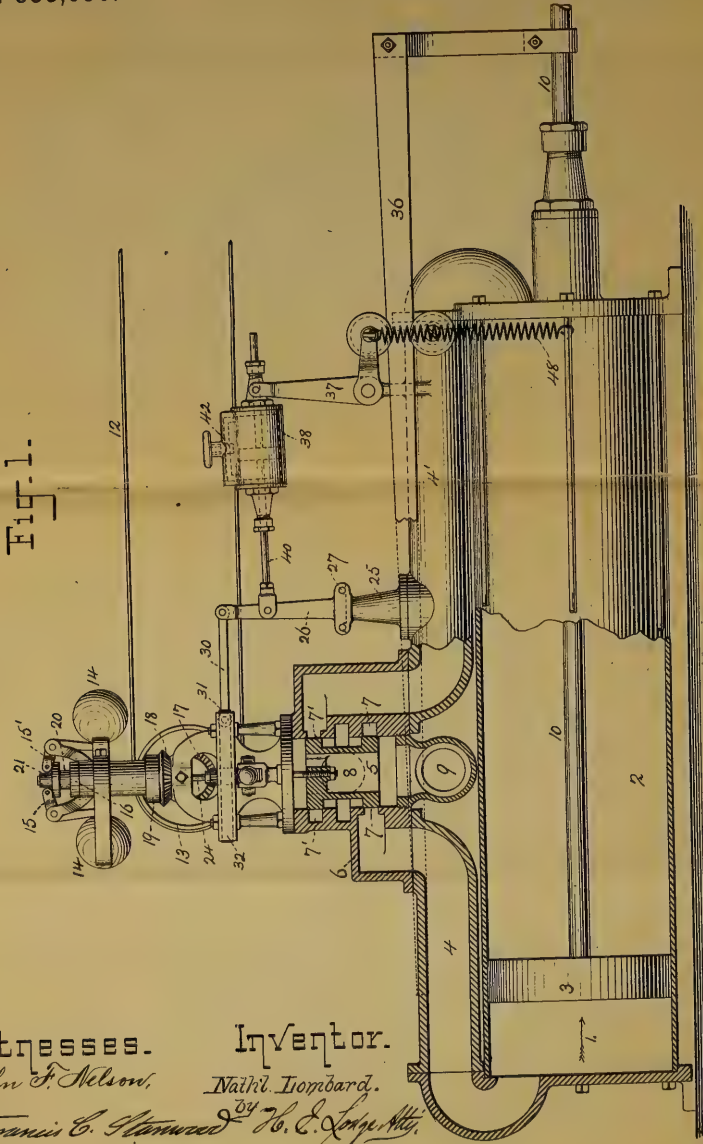
(No Model.)

2 Sheets—Sheet 1.

N. LOMBARD.  
SPEED REGULATOR.

No. 533,656.

Patented Feb. 5, 1895.



Inventor.

John F. Nelson,

Nathl. Lombard.

Francis C. Hammond

by C. E. Long, Att.

(No Model.)

2 Sheets—Sheet 2.

N. LOMBARD.  
SPEED REGULATOR.

No. 533,656.

Patented Feb. 5, 1895.

Fig. 2.

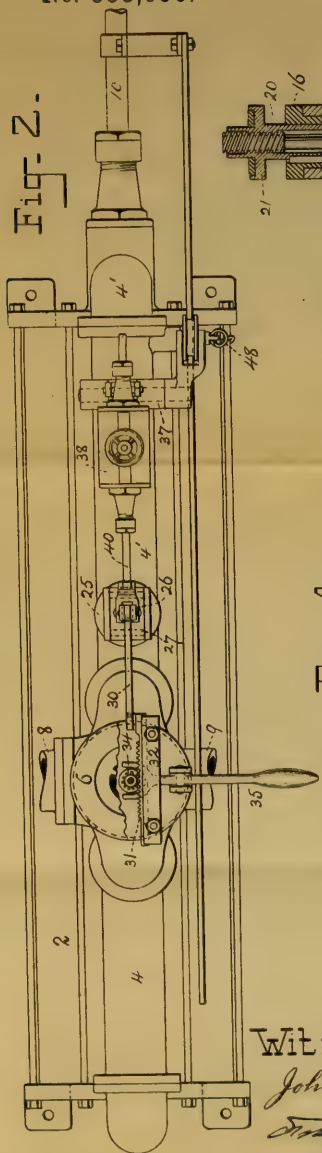


Fig. 3.

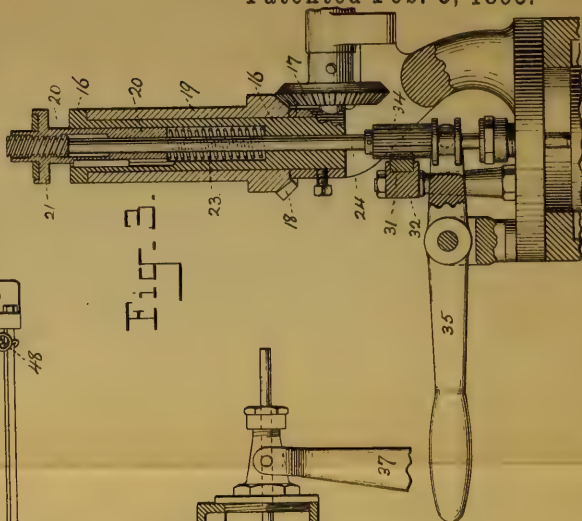
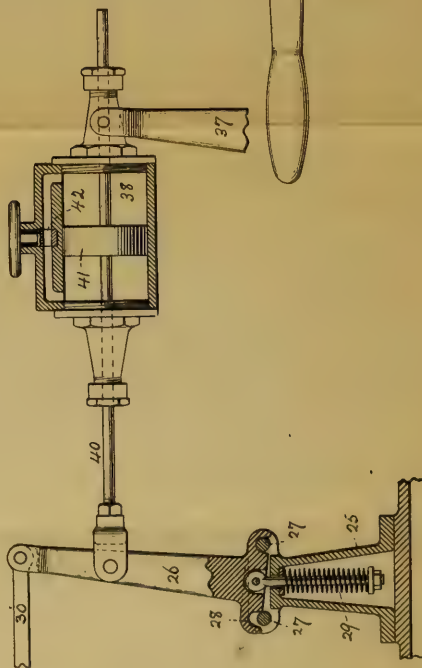


Fig. 4.



Witnesses.

John F. Nelson

Francis C. Stanwood

Inventor.

Nathaniel Lombard.

By H. E. Lodge, Atty.

# UNITED STATES PATENT OFFICE.

NATHANIEL LOMBARD, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE LOMBARD WATER WHEEL GOVERNOR COMPANY, OF SAME PLACE.

## SPEED-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 533,656, dated February 5, 1895.

Application filed August 14, 1894. Serial No. 520,258. (No model.)

*To all whom it may concern:*

Be it known that I, NATHANIEL LOMBARD, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Speed-Regulators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

15 This invention relates to improvements in speed regulators, particularly that class operated by centrifugal action upon revolving weights. It is a well known fact that in regulators of this class there is a tendency to continued changes due to various agencies, as the amount of work, steam pressure, or other incidental causes. As these changes require more or less motive power in the form of steam, water or gases, the valve which admits  
20 such and is controlled by the speed regulator is being incessantly shifted. In consequence of these changes very frequently continual variations in speed occur due to the excessive diminution or increase of the fluid agency—that is, if a change in the main valve is made, the period during which the valve is opened or closed is too long. As a result in the event of the speed falling below the normal the regulator causes the valve to open, and this  
25 latter in lieu of being opened a certain amount and then stopped continues to open. The result is that the speed increases until the normal is not only reached, but very often exceeded, when the weights again operate to partially close the valve, and perhaps reduce the speed too much. However this may be, the general effects of the present and most approved speed regulators are to keep the apparatus fluctuating constantly. This tends  
30 to maintain the speed not at a steady normal rate, but either too fast or too slow.

The purpose and object of my invention is to endeavor to preserve the speed at a normal, and when the main valve which admits  
35 the actuating medium is shifted by the action of the weights, to produce a change, certain

mechanism is put into activity to operate a secondary valve, which checks the movement of the main valve before the full effects of the change in the said main valve upon the motion is fully felt; hence excessive variations cannot take place. If, as before instanced, the speed is below the normal the weight opens the main valve which is very soon stopped; the full amount of gate demanded by the balls not being used. If this is not sufficient the weights again operate and these acts are repeated, the main valve which admits the power, as steam or water, being successively changed until the desired degree of opening or closing is attained.

My present improvements relate to that class of speed regulators in which the main gate or valves supplying the medium, as steam, water or gas, is held in position or changed, as circumstances may require, by means of a piston adapted to reciprocate within a fluid-filled cylinder, the fluid in the latter being allowed to circulate from end to end, and by such circulation to permit movements of the piston. This circulation is regulated by means of a secondary valve under the control of the speed regulator weights, and normally said valve is closed over both inlet and outlet ports by which means the main gate is held locked fast and prevented from moving.

My invention is embodied as before premised in mechanism which operates to bring the secondary valve or that which regulates the circulation of liquid within the closed cylinder to a fixed predetermined position and so maintains it. This secondary valve however is free to be shifted by the action of the regulator weights, and such shifts or changes cause the piston to move within the cylinder; but the mechanism which I consider as novel is intended to return the secondary valve at once or very shortly thereafter to its normal or closed position after it has been shifted or opened by the regulator weights, and also to allow return of the weights to their proper place, and which departure necessitated more or less movement of the main valve, without disturbing the position of the secondary valve. In brief this mechanism comprises a stationary post adapted to rock and to which is attached two oppositely disposed rods, one



equipped with a piston contained within a brake cylinder for air or fluid. The other rod terminates in a rack, which engages a pinion fast about the secondary valve rod. Thus  
5 this valve is adapted to be opened by the regulator weights, while the travel of the piston in the main cylinder serves to reciprocate a tapered bar, which rocks a bell-crank lever and tilts the post to close the secondary  
10 valve. The time during which the post is inclined from the vertical is intended to allow the weights to shift their position commensurate with the change in the speed due to the movement of the secondary valve with-  
15 out changing the said valve from its normal closed position.

The other peculiar features and the method of operating the various parts which co-operate to produce the object to be attained  
20 under my invention will be hereinafter fully set forth and explained.

The drawings represent in Figure 1 a longitudinal sectional elevation of a speed regulator equipped with mechanism embodying  
25 my invention. Fig. 2 is a plan. Fig. 3 is a vertical central sectional elevation in part of the regulator proper, and secondary valve-stem, and transversely of the main cylinder. Fig. 4 is an enlarged view of the rocking post and the secondary cylinder which serves as  
30 the resistance to the movement of said post.

In said drawings I have shown a closed cylinder 2 liquid-filled and adapted to contain a piston 3 which is capable of movement  
35 therein only as the liquid circulates from one side of said piston to the other. This is effected by means of two pipes 4, 4', which connect with a valve 5 termed the secondary valve. This valve is located within a casing  
40 6 and contains the feed parts 7, 7', respectively for the pipes 4, 4', as likewise a common discharge 8. The supply pipe is at 9, while a rod 10 interconnects the piston with the main gate or valve, not shown, which admits the  
45 active medium as steam, water or gas to the prime motor.

A belt 12 to the pulley 13 serves to rotate a pair of centrifugal weights or balls 14. These latter are supported on levers 15, 15',  
50 which are mounted upon a fixed upright 16. Rotation of the balls is created by means of the toothed wheel 17 which meshes with another 18 affixed to the lower end of a sleeve 19 secured to the upright. A flanged tube 20  
55 is placed within the upright standard and is constructed to reciprocate, but not to rotate by aid of a spline and groove connection. The flange 21 bears against the inner ends of the ball levers, while a spring 23 maintains these  
60 parts in contact.

Centrally of the standard is located the rod or stem 24 of the secondary valve. The upper end of this valve-stem or rod 24 is screw-threaded and engages the bore of the  
65 tube 20. Hence it will be understood that the flanged tube 20 is adapted to move up and down according to the changes in the

position of the balls due to varying speed in the rotation of the sleeve 19. Such reciprocations likewise carry the valve 5 and valve-  
70 rod 24 and serve to open the valve wholly or in part, according to the amount of change in the speed; but when circulation takes place in the cylinder 2 the piston 3 is advanced and such movement is accompanied by rota-  
75 tion of the valve-stem. This latter act serves to close the secondary valve without further change in the position of the balls. Immediately after such closing of this valve the balls begin to move again in order to resume the  
80 position they held prior to this change in the gate which has just been effected, this movement of the balls being occasioned by the prime motor now influenced by this change of gate. To prevent the secondary valve be-  
85 ing actuated by such movement of the balls and to retain the valve closed at times and again to allow it to be opened at other times is one of the important features of my invention which I shall now proceed to describe. 90

To effect rotation of the valve stem 24 at proper times and to cause the operating mechanism to quickly close the valve I have employed the following group of instrumentalities: Upon the top of the pipe 4' for compactness of form is secured a hollow block or  
95 pedestal 25 which is capped to receive the base of a rocking post 26. The manner of uniting these two pieces is very simple and consists in the present instance of two trans-  
100 verse pins 27, which enter corresponding grooves 28 in the base of the post, while centrally is a pivotal rod 29 which is pendent from the base but within the pedestal and is spring-actuated. The tension of this spring  
105 is such that the post always tends to assume the vertical whichever way it is inclined from a normal. At the free or top end of this rocking post is positioned a bar 30 which interconnects said post with a toothed rack 31 suit-  
110 ably supported in a horizontal-guide block 32, while a pinion 34 is affixed about the valve-stem 24. This pinion is of considerable length, see Fig. 3, in order that the valve and valve-  
115 rod may be raised or lowered, when the valve is given longitudinal movement without causing the rack and pinion to disengage. A hand lever 35 may be attached in order that manual operation of the secondary valve may be  
120 effected if circumstances require. Furthermore to cause the rotation of the valve-stem which results in sliding of the secondary valve to close and to render this act directly dependent upon the travel of the piston 3, the following elements are provided: In parallel-  
125 ism with the piston rod 10 and attached thereto and moving with it is a tapered bar 36 which serves to oscillate a bell lever 37 fastened to the cylinder 2. One arm of this is equipped with an antifriction roller which  
130 co-operates with a similar roller on the cylinder, while the tapered bar 36 slides therebetween. A spring 48 maintains constant contact between the bell lever and the bar in or-



der to render the latter active should it move in either direction. The upper end of the opposite bell-lever arm is pivotally fastened to a cylinder 38 which serves as a brake or retarder and prevents the too quick return of the rocking post to the vertical, this return being varied by means of liquid or air confined within the cylinder 38. From the rocking post extends a rod 40 which passes through the cylinder, while a piston 41 affixed upon said rod is permitted movement within the cylinder according as the position of a valve 42, operated externally, allows more or less free circulation of the contents between opposite ends of the cylinder. It will be observed that the rod 40 is oppositely attached to the post from that of the bar 30.

The operation and correlation of the various groups of elements hereinbefore described are as follows: it being understood that the secondary valve is to stand normally closed irrespective of the variable positions of the balls. Hence, as before stated, the secondary valve is to be opened by the balls to advance the piston 3 one way or the other, but this shift of the valve is but temporary for the reason that the very act of moving said piston 3 serves to operate to close the valve quickly, but likewise causes said valve to remain closed during subsequent movement and return of the balls to their proper position, and which return has been produced by the change in the main gate just effected. With these premises, it will be seen that the piston 3 is now held stationary, and the main gate (not shown) at the end of the rod 10 positively locked because the valve 5 is shut and no circulation occurs in the cylinder 2. Upon this assumption and that the various parts are now operating normally, when an extra burden is assumed by the prime motor this calls for more main gate. At this moment the ball drop slightly and raise the flanged sleeve 19, see Fig. 3, carrying up the valve-stem and valve 5 which now allows fluid to enter the pipe 4 and advances the piston 3 in direction of arrow 1 to open the main gate; but to prevent excessive results from this opening of the main gate, the tapered bar 36 is withdrawn from beneath the bell-lever 37, when the spring 48 rocks said lever to the right and simultaneously tilts the post 26 likewise to the right since the rapid action of the spring causes the contents in the brake cylinder to serve as a solid body. This tilting of the post to the right also causes the rack to revolve its pinion and the valve 5 is immediately closed by the rotation of its valve stem, the flanged tube being a stationary or fixed point. It is evident that with a change in the gate, as instance, the speed of the prime motor will be accelerated and the balls now below their normal position will tend to rise and resume their proper place. This act would again rotate the valve rod and actuate the valve. Hence to keep said valve closed during the return of the balls, the post is retarded more or

less as it returns to the vertical, since it is this latter act which serves to prevent movement of the valve from its seat, the valve being 70 rotated slowly to maintain a constant position and to counteract the effect which otherwise would be produced by the movement of the balls. This spring mounted post 26 now moves back slowly as the liquid or air in the 75 brake cylinder flows through the valve 42. When said post has again assumed the vertical reverse rotation of the valve-stem 24 has taken place to compensate for the movement of the balls to their proper position and the valve 5 80 is maintained closed during such act.

From the above description it will be understood that the return of the tilting post to the vertical is intended to counteract the return of the weights to their proper position, the deviation of said weights from such position necessitating a change in the main gate. Hence this movement of the post is intended to be slow, as the balls ordinarily are not suddenly influenced by the main gate. It will be further understood that when the post is at the vertical, then movement of the balls in either direction will open the secondary valve. On the other hand the departure of the rocking post from the vertical caused by the movement of the weights will serve to close the valve.

What I claim is—

1. The combination with a centrifugal regulator, a fluid-filled cylinder, and a piston therein which controls a main valve for some prime motor, of a regulator valve adapted to control the travel of the piston, mechanism operated by movement of the piston to close the valve, and means to counteract the functions of the balls in the act of resuming their normal position to prevent the valve being operated, substantially as specified.

2. The combination with a centrifugal regulator, a main valve, a fluid-filled cylinder, and a piston operating the said valve, of a regulator valve for the piston, and mechanism interconnecting said regulator valve and piston and adapted to neutralize at certain times the functions of the regulator weights to move said valve, substantially as and for purposes explained.

3. In combination with a centrifugal regulator, a fluid-filled cylinder, and a piston therefor, a secondary valve to control circulation in said cylinder, and a rocking post operated by the piston to regulate the movements of the valve, substantially as set forth.

4. A centrifugal regulator, a fluid-filled cylinder, its piston, and a valve operated by the regulator, combined with a rocking post, mechanism from the post to the valve, as likewise means to actuate the post by travel of the piston, substantially as stated.

5. In speed regulators having centrifugal weights, a liquid-tight cylinder, a piston therein, a valve to regulate travel of the piston, combined with mechanism operated by the regulator to shift the valve in right line move-

ment without rotation, as likewise means by which to unite the piston with the valve and impart rotation and slide said valve endwise, substantially as specified.

5 6. In combination with a centrifugal speed regulator, a fluid-filled cylinder, its piston, and a valve to control circulation, of a valve rod united with said regulator for right line  
10 sliding travel, a rocking post, a rack and pinion to rotate at times said valve rod to slide the valve, and mechanism to interconnect the post with the piston, substantially as set forth.

7. In regulators, a rotary sleeve, centrifugal weights thereupon, a flanged tube reciprocated by said weights, combined with a valve,  
15 a valve rod longitudinally of the flanged tube, connections between the valve rod and tube to permit independent rotation of the rod means for producing rotation of said rod, and a piston controlled within a cylinder by the move-  
20 ments of the valve, substantially as described.

8. In combination with a cylinder, its piston, a valve to control the travel of said piston, a rocking post, and mechanism to operate the  
25 valve upon tilting of the post, a bar affixed to the piston, a lever to tilt the post, and brake mechanism to regulate the return of the post to a normal, substantially as specified.

9. The combination with a fluid-filled cylinder, a piston, its piston rod, an actuating  
30 bar, and a bell lever operated by the bar, of a rocking post adapted to stand upright a regu-

lator valve operated thereby, means to incline the post from the vertical, and brake mechanism to regulate the return of the post  
35 to an upright position, as stated.

10. The combination with a fluid-filled cylinder, its piston, a brake cylinder, and a regulator valve adapted to slide endwise upon movement of the piston, of a tilting post, a  
40 rack and pinion united with said post to rotate the regulator valve, and a bell-lever likewise connected with said post and actuated by the travel of the piston, substantially as explained.

11. In regulators a cylinder, its piston, a regulator valve, and a reciprocating rod, attached to said valve, combined with a fixed  
45 standard, a tilting post adapted to stand upright thereupon, a bell-lever, and a bar affixed to the piston rod for actuating the said lever, a piston-equipped rod 41 pivotally secured to the post, a brake cylinder secured to the bell-lever, and means to regulate the travel of the  
50 brake piston by which to control the return of the post to a normal, substantially for purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

NATHANIEL LOMBARD.

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No. 695,220.

Patented Mar. 11, 1902.

L. LYNDON.

ELECTROMECHANICAL WATER WHEEL GOVERNOR.

(Application filed Sept. 18, 1900)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

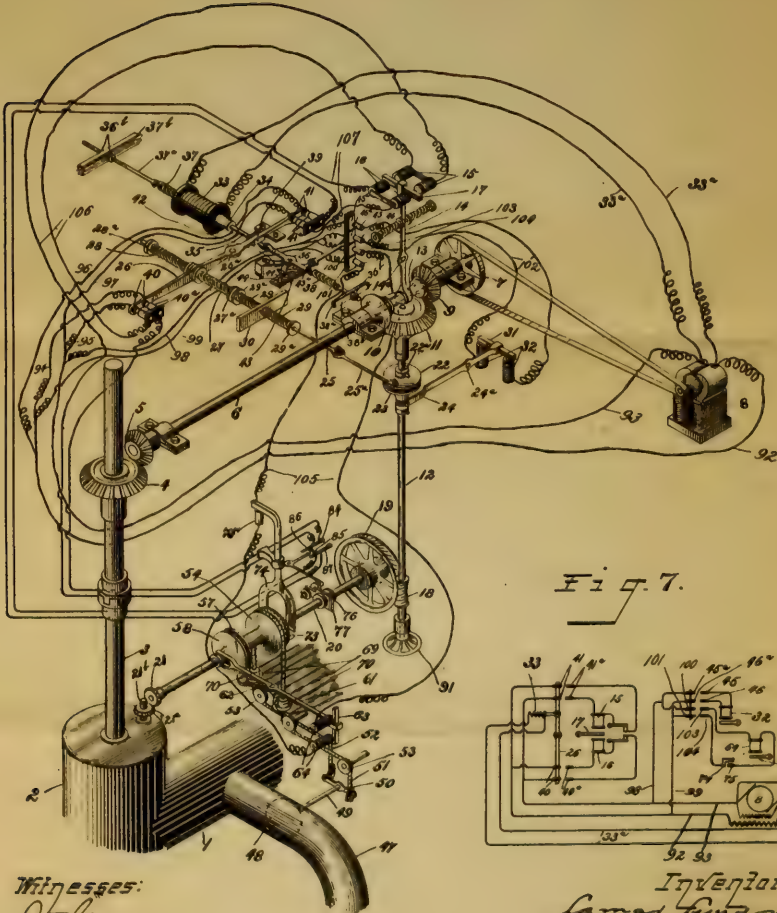
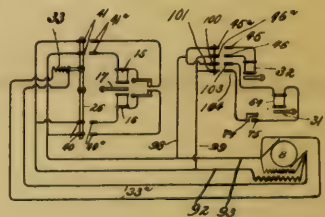


Fig. 7.



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**Patented Mar. 11, 1902.**

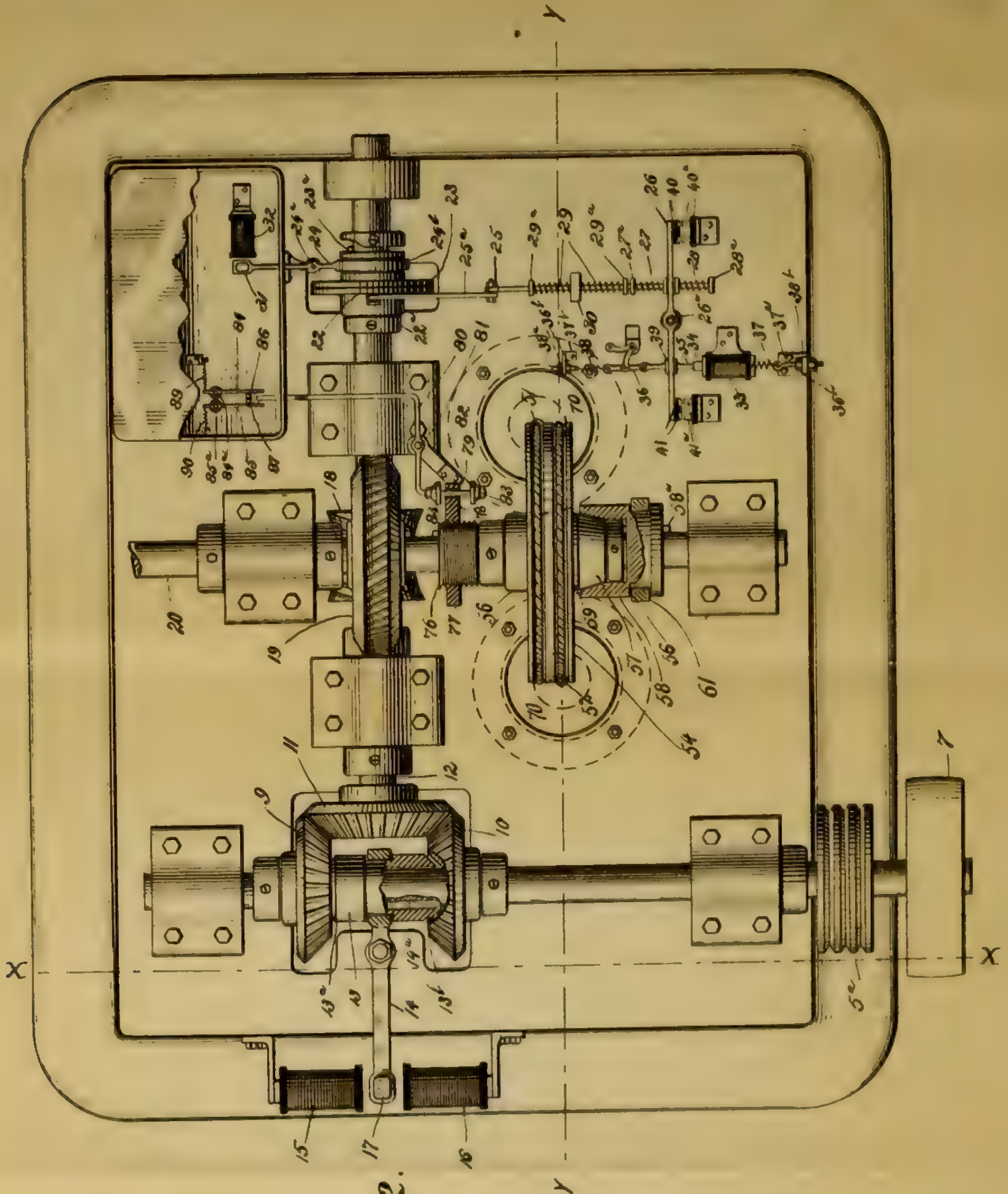
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## ELECTROMECHANICAL WATER WHEEL GOVERNOR.

(Application filed Sept. 13, 1900.)

(No Model.)

**4 Sheets—Sheet 2.**



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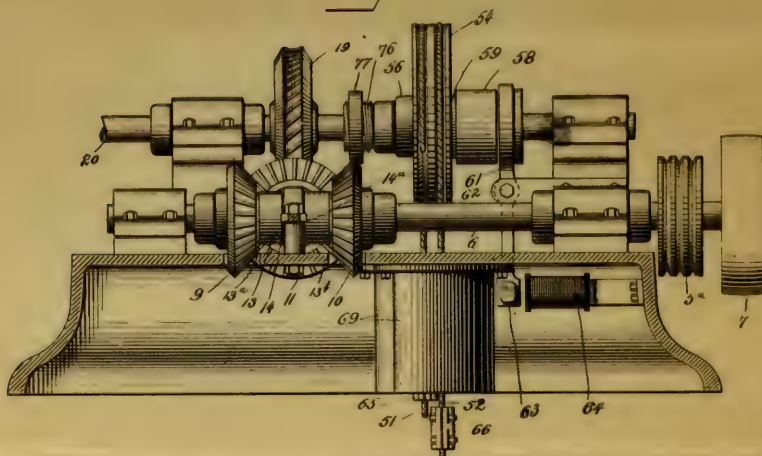
L. LYNDON.

### ELECTROMECHANICAL WATER WHEEL GOVERNOR.

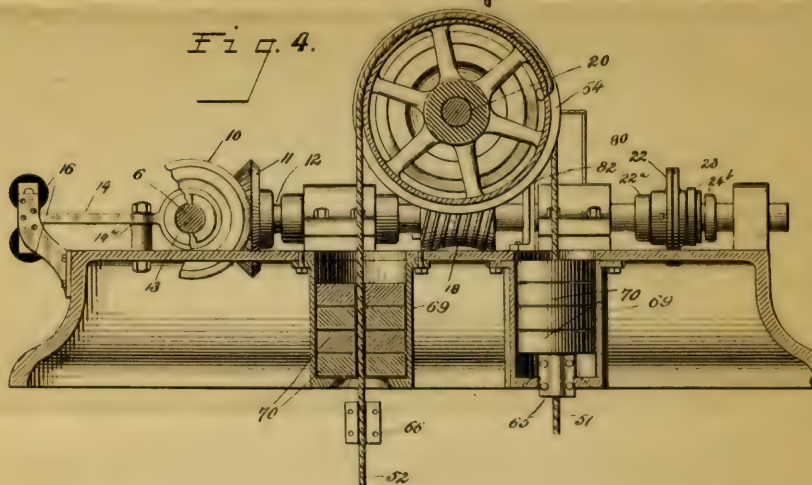
(Application filed Sept. 13, 1900.)

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Fi. 4.



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Patented Mar. 11, 1902.

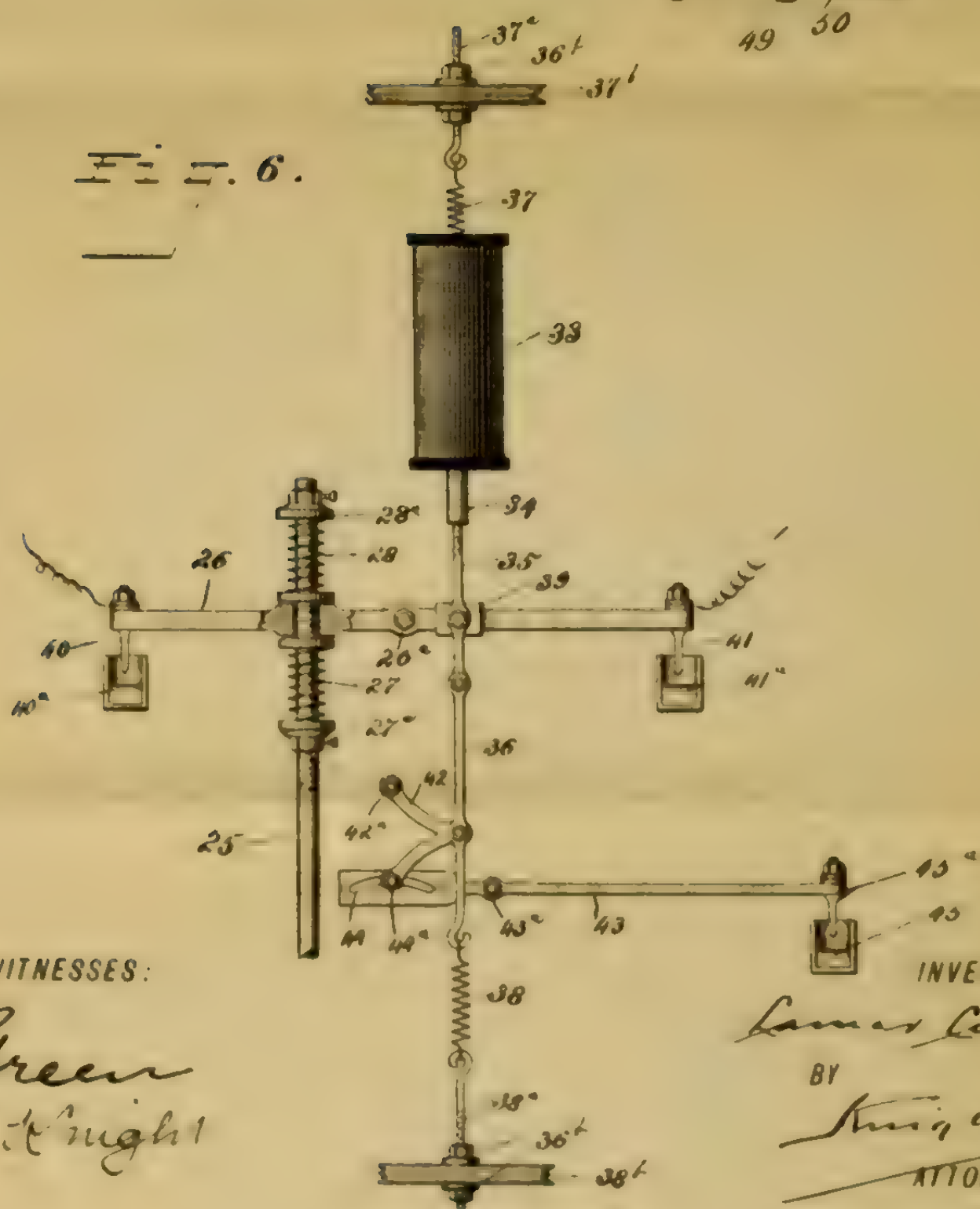
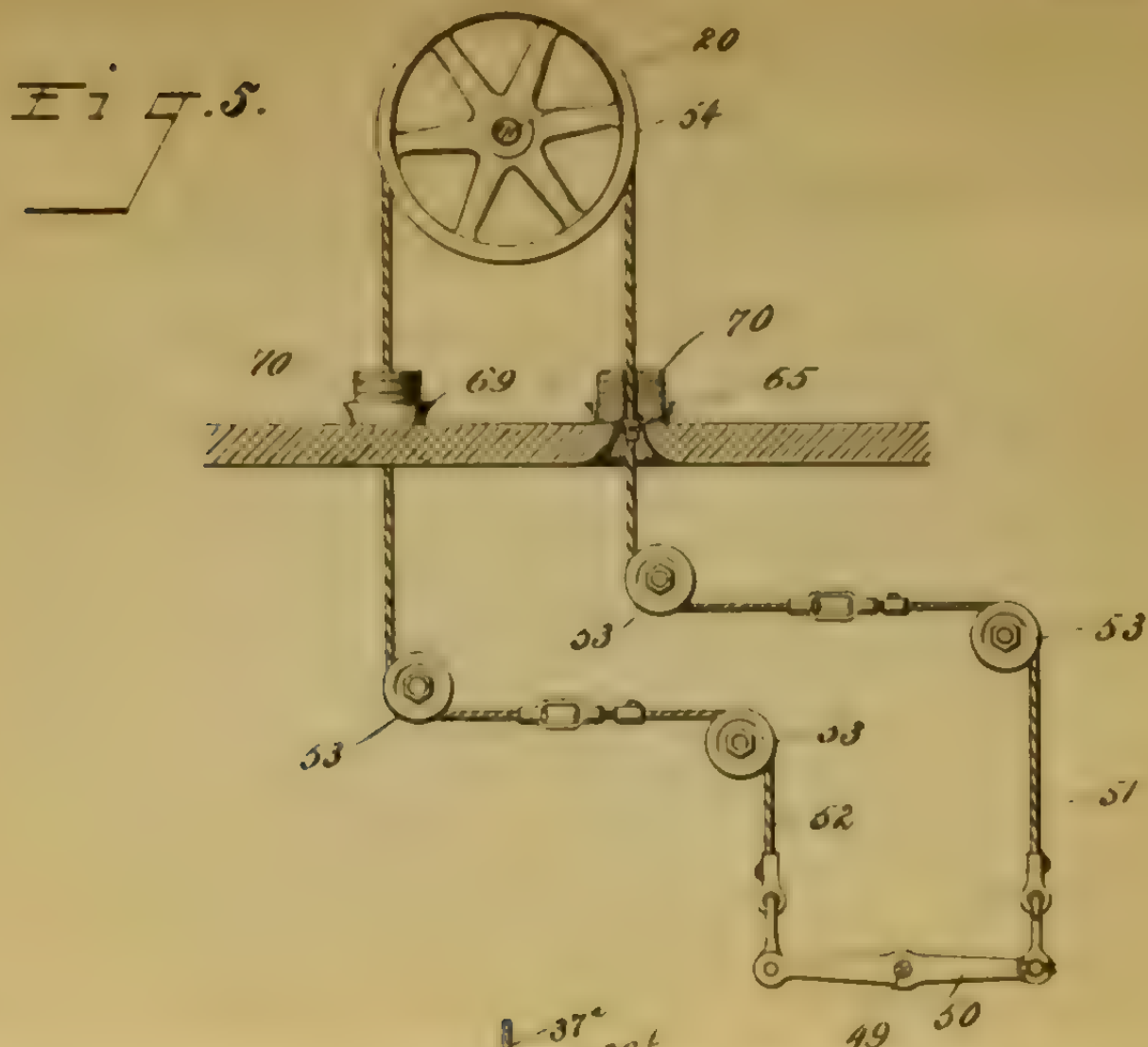
L. LYNDON.

## ELECTROMECHANICAL WATER WHEEL GOVERNOR.

(Application filed Sept 18, 1900.)

(No Model.)

4 Sheets—Sheet 4.



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# UNITED STATES PATENT OFFICE.

LAMAR LYNDON, OF NEW YORK, N. Y.

## ELECTROMECHANICAL WATER-WHEEL GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 895,220, dated March 11, 1902.

Application filed September 13, 1900. Serial No. 29,880. (No model.)

*To all whom it may concern:*

Be it known that I, LAMAR LYNDON, of the borough of Manhattan, in the city, county, and State of New York, have invented certain  
5 new and useful Improvements in Electromechanical Water-Wheel Governors, of which the following is a specification.

The governors at present employed to regulate the water-supply to the water-wheel in  
10 general simply operate to open or close the water-wheel gate, thereby allowing of the admission of a greater or less supply of water. Now the first effect of such opening or closing of the gate, owing to the inertia of the water,  
15 is always the opposite to that which it is desired to bring about—i. e., the opening of the gate operating to momentarily cause less velocity of water at the wheel, owing to the greater orifice the water has to flow through,  
20 and, vice versa, the closing of the gate operating to momentarily cause an increase of velocity, owing to the contraction of the orifice. Moreover, these contrary effects will last until the changed conditions can be imparted to  
25 the source of supply of water.

One object of my present invention is the overcoming of these opposite effects, and for this purpose I provide a by-pass inserted into the penstock or flume at a point near the water-gate and a gate in the said by-pass controlled by the same governing mechanism that controls the water-gate and operating to  
30 allow a greater or less flow through the by-pass, according as the water-gate is being closed or opened.

Other features of my invention relate to means for preventing excessive action of the governor in either direction, so that the governor is not allowed to pass beyond the proper  
40 point for regulation, by reason of the inertia of the parts or for other causes, thereby preventing the oscillation on either side of the regulating-point usual to such devices. Means are also provided for arresting the action  
45 of the governor when the water-gate is fully opened or closed.

Another feature of my invention relates to the control of the governor by a dynamo driven by the water-wheel and so wound that  
50 the electromotive force at the terminals is substantially independent of the load and varies with the speed, but at a rate greater

than the speed variation, so as to obtain greater sensitiveness in regulation.

Other features of my invention relate to details of construction and arrangement, as hereinafter set forth.

Referring to the accompanying drawings, Figure 1 is a perspective and somewhat diagrammatic view of my improved water-wheel  
60 governor. Fig. 2 is a plan view showing in detail certain parts of same. Fig. 3 is a vertical section on the line X X of Fig. 2. Fig. 4 is a vertical section on the line Y Y of Fig. 2. Fig. 5 illustrates a part of my compensating device. Fig. 6 illustrates in detail a part of my controlling device. Fig. 7 is a diagram of the circuit connections.

In Fig. 1 I have shown the penstock 1 leading into the cylinder 2, the latter containing a  
70 turbine water-wheel. (Not shown.) 3 is the main shaft, connecting at one end with the water-wheel and carrying a bevel-gear 4, engaging with another bevel-gear 5 on a shaft 6, as shown in Fig. 1, or connected to drive  
75 such shaft 6 in any suitable manner by belt or rope connection to a sheave 5<sup>a</sup>, (see Fig. 2,) this latter shaft being situated, preferably, at right angles to the main shaft 3. The shaft 6 carries a pulley 7, which is connected by  
80 belting to a dynamo 8. This shaft 6 also carries loosely-mounted bevel-gears 9 and 10. These bevel-gears are adapted to mesh with a third bevel-gear 11, mounted on a shaft  
12, preferably at right angles to the shaft 6.  
85 Mounted on the shaft 6, so as to move longitudinally, but splined thereto, so as to rotate therewith, and located between the bevel-gears 9 and 10, is a sleeve 13, having friction-disks or chamfered ends 13<sup>a</sup> 13<sup>b</sup> or other  
90 form of clutch adapted to engage in holes in the bevel-gears 9 and 10, respectively. A lever 14, fulcrumed at 14<sup>a</sup>, engages at one end in an annular groove in the sleeve 13, while the other end carries an armature 17, adapted  
95 to oscillate between the clutch-magnets 15 and 16.

On the shaft 12 is mounted a worm 18, meshing with a worm-wheel 19 on a shaft 20. The shaft 20 also carries a bevel or spur gear 21,  
100 which meshes with another bevel or spur gear 21<sup>a</sup>, situated on the shaft 21<sup>b</sup>, which operates the water-wheel gate, (the latter not shown.)

A disk 22 is mounted on shaft 12, so as to



be free to rotate, but is held from endwise movement by collars, one of which is shown at 22<sup>a</sup>. On the same shaft is a disk 23, normally out of contact with disk 22, but movable endwise on said shaft into contact with said disk, the disk being caused to rotate with the shaft by a spline connection 23<sup>a</sup>. A lever 24, fulcrumed at 24<sup>a</sup> to a fixed frame part, has a yoke 24<sup>b</sup> engaging in an annular groove in the hub of disk 23 and carries the armature 31 of a magnet 32, herein termed the "returning-magnet." A returning device consisting of a rod 25, connected by a pivoted link or connecting-rod 25<sup>a</sup> with the disk 22, passes through a hole in the controller-lever 26, pivoted at 26<sup>a</sup> to a fixed support, and through a fixed abutment or frame-piece 30. Springs 27 28 are arranged on the rod between lever 26 and respective collars 27<sup>a</sup> 28<sup>a</sup> on the rod, while springs 29 29 are placed between collars 29<sup>a</sup> 29<sup>a</sup> on the rod and the fixed abutting piece 30, these latter springs serving to restore the returning device 25 to normal position after it has been displaced in either direction by the operating-clutch means 22 23. The springs 27 28 enable the returning-rod 25 to exert pressure on the controller 26 to return it to normal position, while permitting displacement of such controller from normal position under the action of its electromagnetic operating means. Such means consist of the solenoid 33, with its soft-iron core 34, carrying a rod 35, springs 37 38 being connected to said core and to a link 36, connected to said rod, so as to act reversely thereon and maintain the core in normal position when the water-wheel is at normal speed, the energization of the solenoid being responsive to such speed. The springs 37 38 are supported by screw-rods 37<sup>a</sup> 38<sup>a</sup>, adjustably secured by nuts 36<sup>b</sup> to fixed supports on frame-pieces 37<sup>b</sup> 38<sup>b</sup>. The rod 35 is pivotally or loosely connected at 39 to the lever 26, which acts as a circuit-controller for the magnets 15 16 of the clutch-reversing gear, said lever carrying contacts 40 41 at its respective ends adapted to engage with fixed contacts 40<sup>a</sup> 41<sup>a</sup>, connected to the respective magnets aforesaid. The solenoid 33 also serves to control the action of the compensator-magnets and returning-magnets through a secondary controlling-lever 43, pivoted at 43<sup>a</sup> to a fixed support and having a widened portion with a slot 44, engaged by a pin or roll 44<sup>a</sup> on one end of a bell-crank 42, which is pivoted to a fixed part at 42<sup>a</sup>, and whose other end is connected by link 36 to the rod 35, the slot being curved reversely to the arc of movement of pin or roll 44<sup>a</sup> on the bell-crank, so that when the lever 26 and rod 35 move in either direction the lever 43 will be moved in one given direction. In such movement of the lever 43 contacts 45<sup>a</sup> 46<sup>a</sup> 100 101, carried thereby, will connect with fixed contacts 45 46 103 104 to close the circuit of the returning-magnet and the compensator-magnet, respectively.

The compensating devices comprise a by-

pass 47, connected around the wheel and leading from the feeder-pipe or penstock at a point near the wheel-gate, the latter, however, being between the by-pass and the wheel. This by-pass is of an area which is a small percentage of the area of the feed-gate. A valve 48 in this by-pass is operated by ropes 51 52, attached to opposite ends of a lever 50 on the stem 49 of said valve, these ropes passing over idlers 53 and around pulley 54, being secured at the ends to said pulley. The double sheave or pulley 54 is mounted on shaft 20, so as to be free to rotate thereon, being held from endwise movement by collars 56. A clutch consisting of corresponding disks or cones 57 58, respectively, on said sheave and on hub 59, mounted on the shaft 20, so as to move endwise, but compelled to rotate therewith by spline connection 58<sup>a</sup>, enables the sheave to be clutched to the shaft, this operation being controlled by a lever 61, pivoted at 62 and having a fork engaging in an annular groove in said hub. The other end of this lever carries the armature 63 of the compensator-magnet 64. On the ropes 51 52 are lugs or clamps or stops 65 66, adapted to engage under and lift weights 70 70 when the sheave is turned either way from normal position, these weights being guided in casings 69 on a suitable fixed support. Means may be provided for easing off the descent of these weights, if desired. For example, the casings 69 may constitute dash-pots.

Upon one side of the sheave 54 are pins; one of which is shown at 73. These pins are adapted to alternately engage a slide-bar 74 to lift same from contact with a contact-piece 75. The said slide-bar is returned to its normal position (which is in engagement with said contact-piece) by any ordinary means, such as gravity or a spring.

76 is a screw-threaded sleeve mounted upon and firmly secured to the shaft 20. A collar or sleeve 77, having a female screw part, is adapted to engage the screw-threaded sleeve 76. This collar of sleeve 77 has upon one side a projecting part 78, having a hole 79, through which passes an end of a rod or lever 80. This collar will therefore be prevented from rotating and will be constrained to move longitudinally of the sleeve. This sleeve is fulcrumed at 81 to a fixed piece 82 and carries on either side of the part 78 tappets 83 83. The other end of the rod or lever 80 projects between contact-levers 84 85, pivoted at 84<sup>a</sup> 85<sup>a</sup> and caused to normally press against the contact-points 86 87 by springs 89 90.

A hand-wheel 91 is adapted to engage the end of the shaft 12. This hand-wheel is readily removable for reasons hereinafter described.

The dynamo which I employ is compound wound and in a manner to give constant potential at the terminals with constant speed independent of the variation of the current. Wires 92 93 lead out from opposite sides of the armature. To these wires are connected,



first, wires 94 95, leading to the contacts 40; second, the wires 96 97, leading to the contacts 41, and, third, the wires 98 99, leading to contacts 45<sup>a</sup> 46<sup>a</sup> on the lever 43 and also to contacts 100 and 101, situated on the same lever. The contacts 45 46, which cooperate with contacts 45<sup>a</sup> 46<sup>a</sup>, are connected together by wire 102, leading through magnet 32. Contacts 103 104, which cooperate with lever-contacts 100 101, are connected together by wire 105, leading through compensating magnet 64 and circuit-breakers 74 75. From the respective sets of contacts 40<sup>a</sup> and 41<sup>a</sup> wires 106 107 lead through clutch-magnets 15 16, such wires including the circuit-breakers 84 86 and 85 87. Wire 33<sup>a</sup> leads from the dynamo to solenoid 33.

The operation of the device is as follows: When the speed of the main shaft 3, owing to an increase or decrease of the load thereon, is caused to fluctuate, the speed of the shaft 6, and consequently that of the armature of the dynamo 8, will also fluctuate. The dynamo which I employ is of the direct-current type, preferably of between three hundred and five hundred watts capacity. It is compound wound, the field-magnet being made up of soft laminated iron. The series winding is to be sufficient only to compensate for drop due to the internal resistance of the machine and to give at any given speed practically a constant potential at its terminal without regard to the quantity of current delivered by it when operating within its capacity. The fields are so proportioned that the magnetic density when the dynamo is running at normal speed is low and below the "knee" of the magnetic curve, say, ten thousand to twelve thousand lines per square centimeter in soft laminated iron. It is evident that a slight increase in speed of the armature will give an increase in voltage, due, first, directly to the increase in speed, and, second, to the increase in magnetic density, which latter increases because of a greater current flowing through the shunt-windings caused by the slight increase of voltage. Therefore a variation in speed of the armature will give a variation in voltage which will change much more rapidly than directly as the first power of the speed variation. The variation in voltage will be approximately as the square of the variation in speed of the armature. As the controlling-solenoid 33 responds directly to the square of the variation of voltage it will be seen that its control will be more sensitive than a control due simply to direct effect of the speed.

We will now assume the main shaft to be revolving clockwise as we look down upon it and also that it revolves at normal speed. Under these circumstances the solenoid 33 is energized to such an extent as to hold the controlling-lever 26 in its mean position, not making contact at either end, and the valve 48 in the by-pass is half open. Suppose that the load in the shaft has been decreased. The speed of shaft 6, and consequently of the pul-

ley 7, will be increased, which will cause an increase of speed of the armature of the dynamo, and consequently of the electromotive force thereof. This will cause a greater than usual energizing of the controlling-solenoid 33, which will cause the core 34 to be drawn farther within it against the tensile force of the spring 37<sup>a</sup>. The operation of the solenoid-core causes the contacts 40 to come in touch with their opposing contact-piece 40<sup>a</sup>, thereby causing an excitation of the clutch-magnet 15. The armature 17 will now be drawn toward the magnet 15, thereby causing the end 13<sup>a</sup> of the sleeve 13 to clutch the gear-wheel 9. The gear 9 will now be constrained to rotate with the shaft 6, and this will cause the gear-wheel 11, and consequently the shaft 12, to also rotate. The shaft 20 will therefore, through the worm 18 and worm-wheel 19, be caused to rotate and the water-gate will be closed.

In order that the shafts 12 and 20 may not tend to continue to revolve in either direction after the complete opening or closing of the gate, means must be provided for interrupting the circuit controlling the clutch-magnets. To this end I provide the screw-threaded sleeve 76 and collar 77, herein described. A certain number of revolutions of the shaft 12 will completely open or close the gate. The same number of revolutions will cause the collar 77 to travel the entire length of the sleeve 76. When the said collar arrives at a point near the end of the said sleeve, it will come in contact with one of the tappets 83, causing it, and consequently the rod or lever 80, to move with it. The other end of the rod, projecting, as it does, between the ends of the contact-levers 84 85, will cause one or the other of said levers (depending upon the direction of revolution of the shaft 12) to be lifted from contact with the contact-points 86 87, which operation will break the circuit of the corresponding clutch-magnet. This contact-lever will be kept out of contact until the shaft 12 is revolved in the opposite direction, when the collar 77 will travel away from it, thus allowing it to again come in contact with its contact-point. The rod 25, disks 22 and 23, and the controlling clutch-magnet 32 constitute a returning device for preventing the governor from overrunning—that is, moving the water-wheel gate a greater distance than is actually necessary for proper regulation—this necessitating a second movement of the gate in an opposite direction, which in turn may overtravel and require the gate to be moved back again. With an "overrunning" governor the gate movement is to a certain extent oscillatory, the amplitude of movement decreasing until the proper position of the gate is finally reached. When the governor-shaft 12 is set in operation in either direction by the controlling-solenoid 33, the rod 36 operates the lever 43 to close the circuit of the clutch-magnet 32, which causes engagement of disks 23 22 and causes



the disk 22 to be carried slightly around one way or the other, according to the direction of movement of the governor-shaft 12, thereby returning the lever 26 to normal position.

5 This movement of the returning-rod 25 is resisted by spring 28 or 29, according to the direction of operation. As soon as the lever 26 is returned to normal position it operates directly through contacts 100 101 to deenergize the clutch-magnet which set the governor in operation and indirectly through lever 43 and contacts 46<sup>a</sup> 46<sup>b</sup> to deenergize the clutch-magnet for the returning device, the latter being thus released and returning to  
10 normal position under the influence of its spring. When the gate is operated, as above described, the lever 43 is moved to close the contacts 45<sup>a</sup> 46<sup>a</sup> 100 101, this closure being effected whatever the direction of movement  
15 of the controlling-lever 26 by reason of the pin and curved-slot connection between such levers. Current will therefore flow from the dynamo through wires 92 98, contacts 100 and 103, to wire 105, leading through the compensating magnet 32, and thence through  
20 contacts 74 75 and 104 101 to wires 99 93, back to the dynamo. Magnet 32 then engages clutch 58, and thus throws the by-pass valve into operative relation through the  
25 ropes 53, sheave 54, and clutch 58 with the gate-operating shaft 20. Consequently the by-pass valve will be turned toward open or shut position, according to whether the gate is closing or opening, for the purpose above  
30 stated. Normally the gate or valve in the by-pass will be half-way open, so that the amount of water flowing through the by-pass and around the wheel without doing work will be half the amount which the by-pass is capable of carrying. When the governor acts  
35 to close the main gate, the compensating device will open more widely the by-pass. The rapidity with which the valve in the by-pass opens is such that the increased volume of  
40 water which it allows to pass through is proportional to the decrease in area which the main gate effects by reason of its closing. Should the main gate open, a reverse action takes place. The object of this compensating device is to take care of the inertia effect  
45 of the column of water in the feed-pipe. As is well known, if a water-wheel gate be suddenly opened to increase the speed of the wheel the first effect will be to actually decrease the speed of the wheel, for the reason  
50 that the velocity of the water through the gate drops, because a larger area for the water to pass through is provided, and a larger volume of water is not immediately provided, because there is a time element required, which  
55 time element is the length of time required for gravity to accelerate the entire volume of water contained in the feed-pipe, which cannot be accomplished instantaneously. If the  
60 water-wheel gate be closed, a reverse effect will be noticed—that is, instead of decreasing the speed of the wheel the speed will actually

rise, owing to increased velocity, through the water-wheel gate, due to a decreased area of opening, while the volume of water remains  
65 for the time constant, the volume decreasing only after a short time has elapsed, which length of time is required to arrest the column of water in the feed-pipe. It is obvious that the by-pass, arranged as described, opening or closing in a manner opposite to that in  
70 which the main gate opens or closes will, if properly adjusted, admit of the main gate being rapidly operated and the governing of the water-wheel quickly accomplished. After  
75 the governing takes place the by-pass gate is either open or closed, or nearly so, and in order to be useful for a second governing must return to its normal position. It, however, must return slowly in order that the  
80 effect of increased or decreased speed of water through both the by-pass gate and the water-wheel gate will not take place. It is here to be noted that all water-wheel governors as made to-day must accomplish their  
85 governing only at such a speed as the acceleration or retardation of the water in the column of the pipe can be accomplished, whereas in the case of the governor hereinbefore described, with the compensation-gate and  
90 actuating apparatus, the time element is removed from the main gate and the water-wheel and taken care of in the by-pass.

When the governing is completed, the controlling-solenoid allows the lever 26 to return  
95 to normal position, the circuit of the compensating magnet is broken by the return of rod 30 and lever 43, and the butterfly-valve returns slowly under the influence of its weight 70 to normal position.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a governor for water-wheels, the combination with a water-gate-operating shaft  
100 and a driving-shaft, of a reversing clutch-gear, adapted to connect the water-gate-operating shaft to the driving-shaft in reverse driving relations, means for reversely controlling the operation of such clutch-gear, a  
105 dynamo connected to be driven from the water-wheel and wound to maintain constant potential for varying currents therein, but to vary the potential in a greater ratio than the speed, an electromagnetic device connected  
110 to such dynamo, and controlling the clutch-gear-controlling means, and means for resisting the action of said electromagnetic device in such manner, that at normal speed the clutch mechanism will be disengaged, but on  
115 increase or decrease from normal speed the clutch will be operated to govern the water-gate through its operating-shaft.

2. In a governor for water-wheels, the combination with a water-gate-operating shaft  
120 and a driving-shaft, of a reversing clutch-gear, adapted to connect said shafts in reverse driving relations, electromagnetic means controlling such clutch-gear, a dynamo connect-



ed to be driven by the water-wheel and wound so as to deliver an electromotive force varying in a greater ratio than the speed of the water-wheel, a solenoid connected to said dynamo and a device controlled by said solenoid and carrying a contact device, and energizing connections for the electromagnetic gear-controlling means, controlled by said contact device.

3. In a water-wheel governor, the combination with a water-gate-operating shaft, and means for operating same in either direction to govern the water-wheel, of a controller for said operating means, responsive to changes of speed of the water-wheel, a returning device for said controller provided with a clutch connection to said operating shaft, and means, actuated by said controller on movement thereof from normal position to engage said clutch with the said shaft, so as to cause the return of the controller to normal position and interrupt the governing action before it has overrun the proper amount, substantially as and for the purpose set forth.

4. In a water-wheel governor, the combination with a water-gate-operating shaft, a driving-shaft and reversing clutch-gear, adapted to turn the water-gate-operating shaft in either direction, a controller, responsive to changes of speed of the water-wheel and controlling such reversing-gear, and a returning device for said controller provided with actuating means controlled by said controlling means to return the controller to inoperative position, so as to prevent excessive movement of the governor.

5. In a water-wheel governor, the combination with a water-gate-operating shaft, a driving-shaft and a reversing clutch-gear, adapted to connect said shafts so as to cause the water-gate-operating shaft to move in either direction, a dynamo operatively connected to produce an electromotive force responsive to the speed of the water-wheel, a solenoid device energized by said dynamo, a core for said solenoid and a circuit-controller actuated thereby, springs for holding the circuit-controller in normal position, two electromagnetic devices for reversely operating the reversing clutch-gear, a returning device adapted, when operated, to return the circuit-controller to normal position, a clutch adapted to bring said returning device into operative connection with the water-gate-operating shaft, a magnet controlling said clutch and a circuit for said magnet including a circuit-closer operatively connected with the aforesaid circuit-controller and adapted to energize said magnet on movement of the circuit-controller in either direction.

6. In a water-wheel governor, the combination with means for operating the water-gate in either direction, a by-pass for the water-wheel, and a valve controlling said by-pass,

of means connected to the water-gate-operating means and operating the by-pass valve inversely to the operation of the water-gate.

7. In a water-wheel governor, the combination with means for operating the water-gate in either direction from normal position, a by-pass for the water-wheel, and a valve for such by-pass, of means connected to the water-gate-operating means and adapted to operate the by-pass valve from normal position in either direction, so as to control such valve inversely to the control of the water-gate, during the governing action of the water-gate, and means for returning the by-pass valve to normal position on completion of governing movement of the water-gate-operating means.

8. In a water-wheel governor, the combination with a shaft for operating the water-gate in either direction from normal position, a by-pass for the water-wheel and a valve for such by-pass normally held in partly-open position, of an operating device for said valve provided with means for returning the valve to normal position, a clutch, adapted to connect said operating device for the by-pass valve with the water-gate-operating shaft to control the by-pass valve inversely to the water-gate, reversing means for operating the water-gate-operating shaft in either direction, a controller, responsive to the speed of the water-wheel and controlling said reversing means, and means operated by said controller to bring the aforesaid clutch into operation and to release said clutch when the governing action is effected.

9. In a water-wheel governor, the combination with a shaft adapted to operate the water-gate in either direction from normal position, a by-pass for the water-wheel and a valve for such by-pass, normally held in partly-open position, of means adapted to operate said valve in either direction and provided with means for returning the valve to normal position, a clutch, adapted to connect such operating means with the water-gate-operating shaft, a driving-shaft, and a reversing-gear for turning the water-gate-operating shaft in either direction, a dynamo connected to the water-wheel, so as to be responsive to the speed thereof, an electromagnetic device connected to said dynamo, a controller operated by said electromagnetic device and controlling the said reversing-gear, a magnetic device controlling the aforesaid clutch for the by-pass-operating means, a circuit for said magnet and means operated by said controller in its movement in either direction to close such circuit.

LAMAR LYNDON.

Witnesses:

A. P. KNIGHT,  
HARRY E. KNIGHT.





United States  
3  
**Circuit Court of Appeals**  
**For the Ninth Circuit.**

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GEORGE J. HENRY, JR.,

Appellant,

VS.

CITY OF LOS ANGELES,

Appellee.

---

**BOOK OF ADDITIONAL ORIGINAL  
EXHIBITS.**

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Upon Appeal from the United States District Court for  
the Southern District of California,  
Southern Division.

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FILED  
MAY 17 1908  
U. S. DISTRICT COURT  
SOUTHERN DISTRICT OF CALIFORNIA



**United States**  
**Circuit Court of Appeals**  
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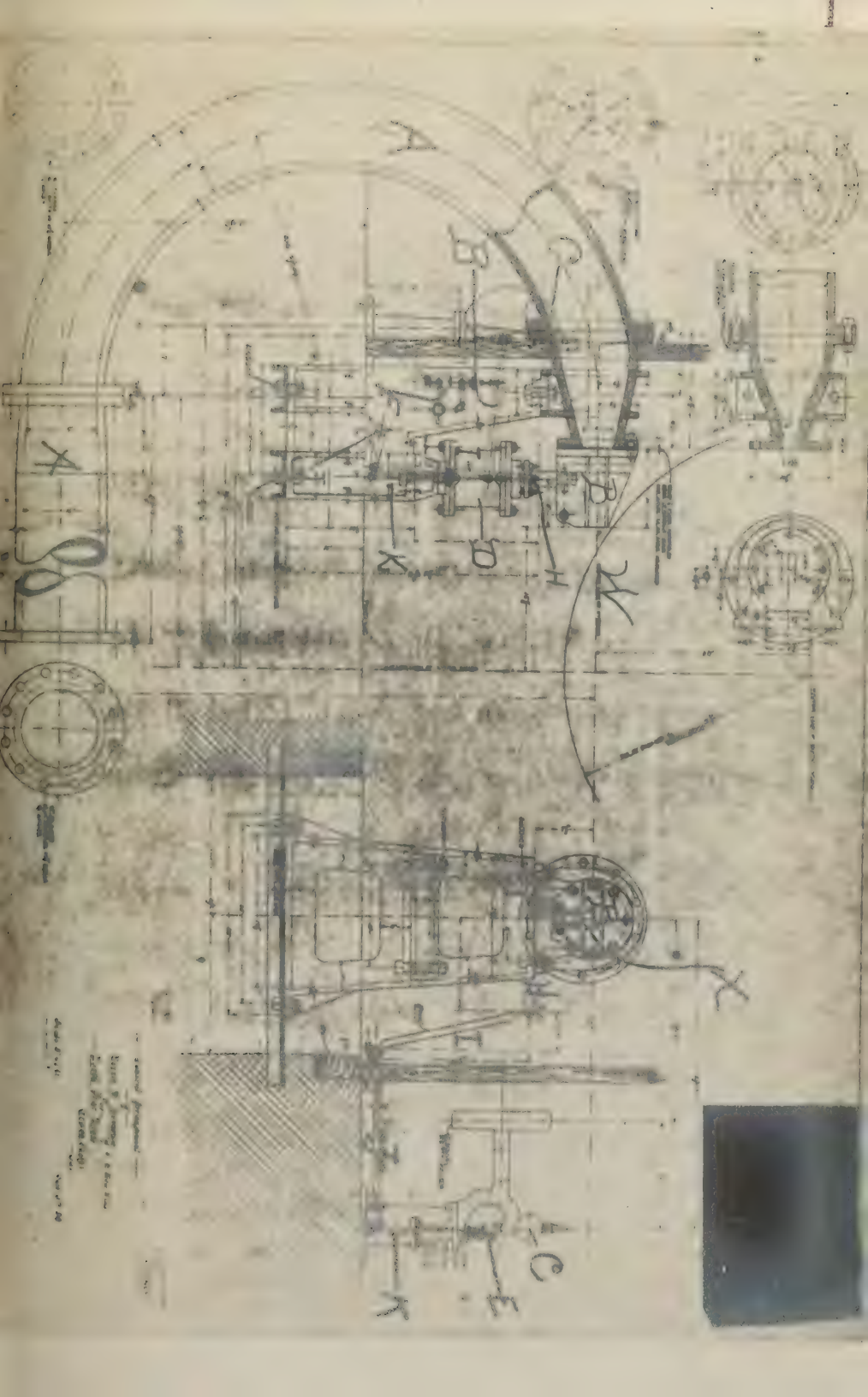




# INDEX TO BOOK OF ADDITIONAL ORIGINAL EXHIBITS.

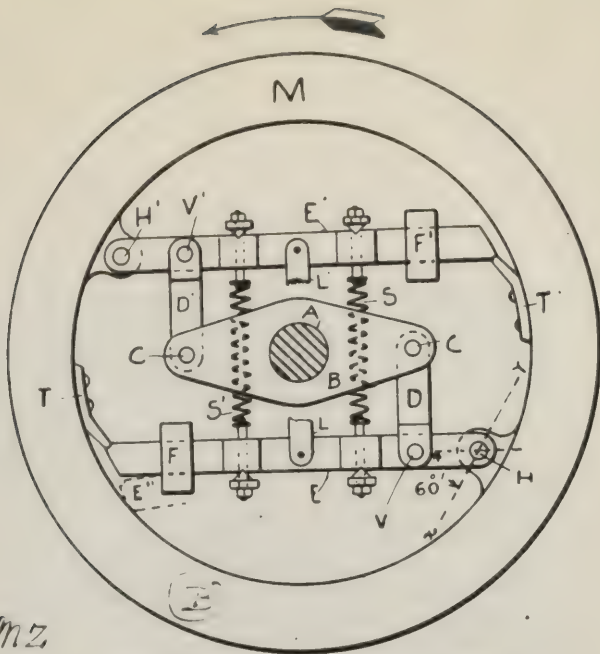
	Page
Complainant's Exhibit KK—Blue-print .....	66
Complainant's Exhibit LL—Blue-print .....	67
Complainant's Exhibit Power Development Company Plant. Photograph A.....	77
Complainant's Exhibit Power Development Company Plant. Photograph B.....	79
Complainant's Exhibit Power Development Company Plant. Photograph D.....	75
Complainant's Exhibit Power Development Company Plant. Photograph E.....	77
Complainant's Exhibit Power Development Company Plant. Photograph H.....	75
Complainant's Exhibit Power Development Company Plant. Photograph I.....	79
Complainant's Exhibit Wilson Sketch A.....	70
Complainant's Exhibit Wilson Sketch B.....	70
Complainant's Exhibit Wilson Sketch C.....	71
Complainant's Exhibit Wilson Sketch D.....	71
Complainant's Exhibit Wilson Sketch E.....	72
Complainant's Exhibit Z—Blue-print of Lombard Governor Without Control-operated Clutch .....	68
Complainant's Exhibit ZZ—Blue-print of Lombard Governor Device With Control-operated Clutch .....	69
Defendant's Exhibit Blue-print Showing Nozzle and Governor for North Star Mines.....	1

Index.	Page
Defendant's Exhibit MZ—Diagram Showing Details of the Girard Governor.....	2
Defendant's Exhibit XX—Photograph Showing Ram, Nozzle and Pass-by Equipment of the Girard Governor .....	3
Defendant's Exhibit ZZ—Photograph Showing the Girard Fly-wheel Governor .....	3
Defendant's Exhibit Cobb Blue-print No. 1....	12
Defendant's Exhibit Cobb Efficiency Report...	23
Defendant's Exhibit Cobb Pressure Regulating Device Circular .....	11
Defendant's Exhibit Cobb & Hesselmeyer Report of August 8, 1896.....	15
Defendant's Exhibit Perry Blue-print No. 1...	43
Defendant's Exhibit Photograph Showing Interior of Power Development Co's Power House .....	13
Defendant's Exhibit Lamb Patent—File Wrapper .....	43
Defendant's Exhibit Translation of French Patent .....	50
Defendant's Exhibit Translation of Swiss Patent .....	57









DETAILS OF THE GIRARD GOVERNOR.

U. S. Dist. Court  
Southern Dist. of California  
Southern Division  
vs. Henry, Jr.

In Equity

City of Los Angeles  
Defendant

A-87

Defendant's Exhibit MZ

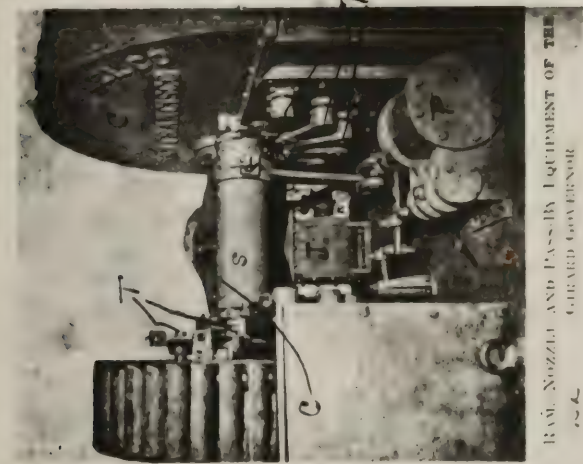
J. Benjamin  
Special Examiner  
in Charge

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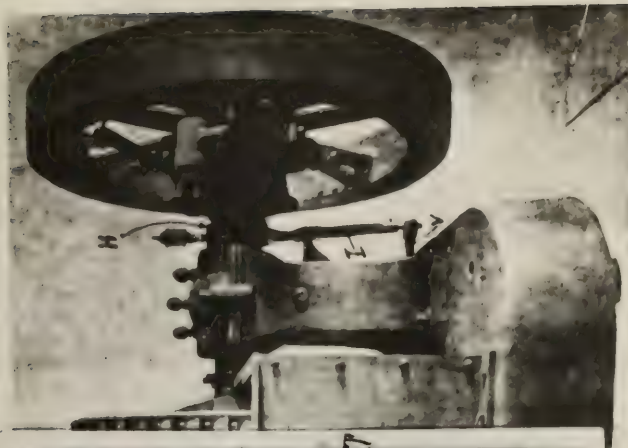
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F. D. MONCKTON,  
CLERK.





RAY NOZZLE AND PASS-BY EQUIPMENT OF THE  
GIRARD GOVERNOR



THE GIRARD FLY-WHEEL GOVERNOR.





**Defendant's Exhibit "XX."**

[Endorsed]: U. S. Dist. Court, Southern Dist. of California, Southern Division. Geo. J. Henry, Jr., Complainant, v. City of Los Angeles, Defendant. In Equity—A-87. Defendant's Exhibit "XX." Apr. 1, 1914. I. Benjamin, Special Examiner in Chancery.

Edw. S. Cobb, 1121 Central Bldg., Los Angeles, Cal.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.

**Defendant's Exhibit "ZZ."**

[Endorsed]: U. S. Dist. Court, Southern Dist. of California, Southern Division of California. Geo. J. Henry, Jr., Complainant, v. City of Los Angeles, Defendant. In Equity—A-87. Defendant's Exhibit "ZZ." I. Benjamin, Special Examiner in Chancery. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Edw. S. Cobb, 1121 Central Bldg., Los Angeles, Cal.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.

**Defendant's Exhibit Cobb Pressure Regulating Device Circular.**

[Endorsed]: U. S. Dist. Court, Southern Dist. of Cal., Southern Division. Geo. J. Henry, Jr., Complainant, v. City of Los Angeles, Defendant. In Equity—A-87. Defendant's Exhibit Cobb Pressure Regulating Device Circular. Apr. 8, 1914. I. Benjamin, Special Examiner in Chancery. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monekton, Clerk.

**IF YOU ARE USING A PIPE LINE FOR CONVEYING WATER THIS WILL INTEREST YOU.**

The apparatus herein illustrated has been designed to use in connection with pipe lines conveying water for power or other uses, and is for the purpose of absolutely preventing the fluctuations of pressure, which occur in such lines when the flow of water is suddenly checked or changed.

The phenomena of "RAM" or shock in pipe lines have been observed by all, and many devices have been suggested for effecting a protection for the pipe against bursting, or other serious injury; but so far as we have been able to learn, none have been applicable to all conditions and few have been effective under any conditions.

The application of an air chamber of suitable dimensions gives to a pipe line an elasticity to resist

shock, not attainable with any other known device—and as far as receiving and absorbing the shock is concerned, probably no better device will be forthcoming. But where the flow of water in the pipe line is used to drive water-wheels, and when the quantity of flow is regulated by increasing or diminishing the area of cross-section of the nozzle, the use of an air chamber has presented some difficulties.

To illustrate, consider a pipe line, flowing full of water at a normal velocity under head or pressure, and discharging through an orifice of variable cross-section. Let this pipe be provided with an air chamber placed at a point preferably near the point of discharge; suppose that the cross-section of the discharge orifice be suddenly decreased, then the normal velocity of flow in the pipe line must be as suddenly checked; and the excess energy of the moving mass will be spent in, first: compressing to a greater degree the air confined in the air chamber; and, second: in giving an increased velocity of flow through the reduced discharge area.

The air in the air chamber thus compressed above its normal pressure will react and cause a return flow or rebound of water in the pipe line, the energy of which will be as great as the original excess energy of flow, less the loss due to friction, and this alternate flow and rebound will continue in action until friction has absorbed the excess energy of the moving mass.

The alternate flow and rebound above referred to, cause coincident increase and decrease of velocity of flow at the discharge orifice, and render the attain-

ment of uniform speed in the water wheel a matter of great uncertainty; even, when the best known forms of governors are in use.

The apparatus here illustrated, embodies the elastic air chamber to receive and absorb the shock, and the reaction of the air compressed above normal is prevented by introducing an automatic stop valve between air chamber and pipe line as shown—thus absolutely preventing any rebounding action, and coincident fluctuation of pressure at the discharge orifice.

The water which enters the air chamber during the compression of the air therein is discharged through a suitable waste valve at the side. This valve being opened by the excess of pressure above normal, that was entrapped in the air chamber, and closes automatically when the water discharging from the air chamber has reduced the pressure therein down to normal conditions. It will be observed that under this arrangement—

- 1st. Only that amount of water is wasted which is passed through the air chamber as an exact measure of the energy of the “Ram” overcome.
- 2nd. That under normal conditions, the pressures in the air chamber and pipe line are equal, and hence the automatic stop valve between air chamber and pipe is in balance.
- 3rd. That in most situations, the simple arrangement shown in Figure 1, may be used, as the confined, non-fluctuating, excess pressure in



the air-chamber is an ideal medium to operate a safety valve as there shown.

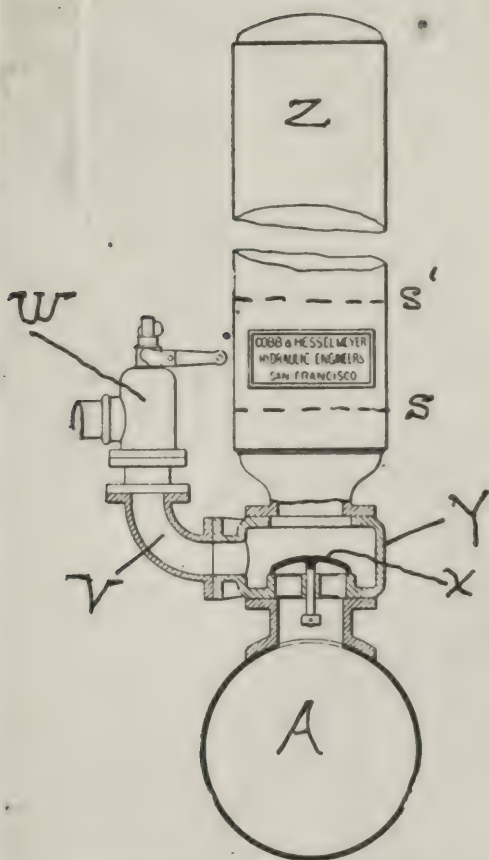
- 4th. That if an exceptionally close regulation of pressure in the pipe line is desired, other arrangements not shown may be used, wherein the discharge valve from the air chamber is operated by an hydraulic cylinder, the piston of which receives on one of its faces the pressure of the air-chamber, and on its opposite face a constant pressure, from the accumulator shown, exactly equal to the normal working pressure of the pipe line.
- 5th. That full information in regard to this device as applied to any pipe line under any conditions, will be cheerfully given.

EXTRACT  
from  
Page and One-Half Editorial  
in  
“ENGINEERING NEWS.”

---

July 8, 1897.

\* \* \* \* \* “The reader who has followed the above discussion can now form an intelligent opinion as to the merit of the device of Mr. E. S. Cobb, described in Mr. Richards’ paper. It appears to us to be an excellent device, and likely to prove effective if properly designed. We desire to call especial attention to the waste valve of this device, which appears to us likely to prove the best method for controlling the flow in long pipes and solving the difficulties in governing the speed of wheels, and in controlling the pulsations and shocks in the pipe to which we have referred. Such relief valves should be proportioned to the size of the pipe they control, and should be located as near to the nozzle of the pipe as practicable. They should be so loaded as to open automatically when the pressure in the conduit rises somewhat above the normal working pressure, and would then act to prevent the further increase of pressure in the pipe. The water wasted through them would be comparatively small in amount and would furnish, we believe, the cheapest and simplest way of taking care of the energy that appears when the velocity of flow in the conduit is checked.” \* \* \*



PATENTED AUGUST 3, 1897

Fig. 1





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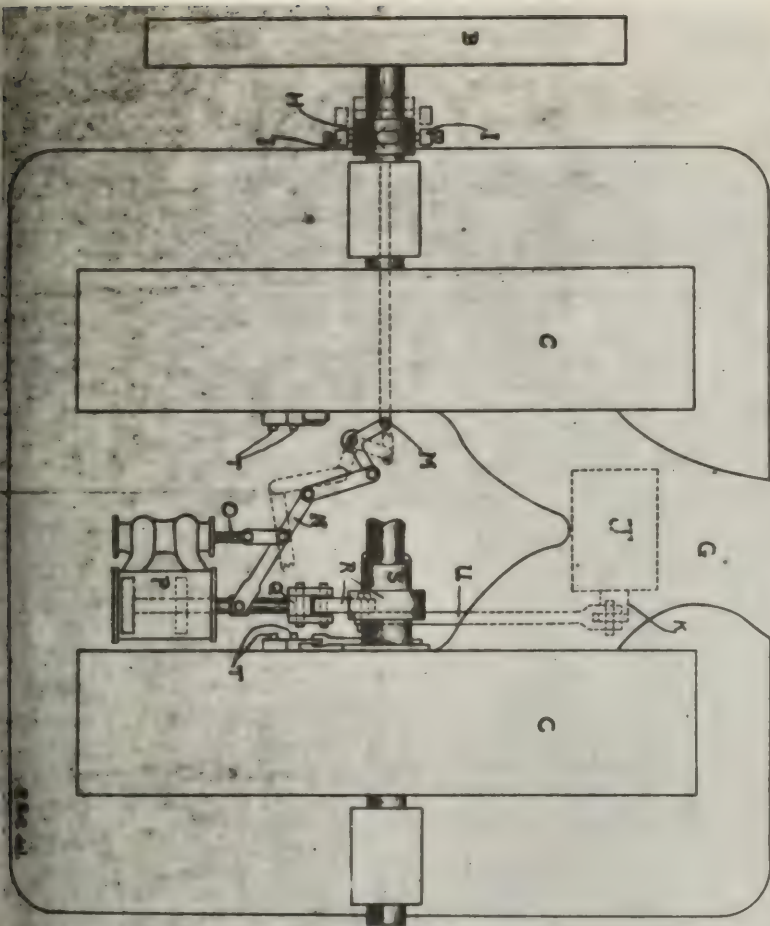
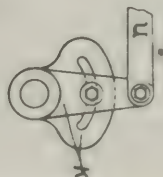
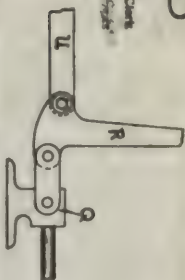
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WILL. M. VAN DYKE, Clerk

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F. D. MONCHTON,  
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 City of Los Angeles }  
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ES.C







**Defendant's Exhibit Interior of Power Development  
Co's. Power House.**

[Endorsed]: U. S. Dist. Court, Southern Dist. of California, Southern Division. Geo. J. Henry, Jr., Complainant, vs. City of Los Angeles, Defendant. In Equity—A. 87. Defendant's Exhibit Interior Power Development Cos. Power House. Apr. 1, 1914. I. Benjamin, Special Examiner in Chancery. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Return to Edw. S. Cobb, 1121 Central Bldg., Los Angeles, Cal.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.

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**Defendant's Exhibit Cobb & Hesselmeyer Report of  
August 8, 1896.**

San Francisco, Cal., Aug. 7th, 1896.

**POWER DEVELOPMENT CO.,**

San Francisco, Cal.,

C. N. Beal, Secretary.

Dear Sir:—

We present herewith a synopsis of the claims made by the several bidders for Water Wheels and Governors to be used in your power house near Bakersfield, Cal., also a general description of the operation of the special form of plant proposed by them and detailed description of their several operating devices, and our opinion in reference to the best proposal for you to adopt and our reasons for this opinion so far as the same can be briefly set forth.

The "Outline Specifications" furnished to bidders as a basis and guide for their proposals called briefly for the following items to operate according to the conditions given: First, two sets of water wheels to develop 750 H. P. each when running at 257 R. P. M. under an effective head of 190 feet; second, each set to be entirely independent, self-contained and complete with all details and accessories for operation; third, approved automatic governing devices to regulate speed in the varying conditions of load; fourth, guaranteed water efficiencies, and guaranteed percentage of perfect regulation under varying conditions of load.

In full response to the requirements of the above specifications, three proposals and bids for the required machinery have been received from the following firms:

Risdon Iron Works, Knight Wheels;

Pelton Water Wheel Co., Pelton Wheels.

Girard Water Wheel Co., Girard Wheels.

These will be referred to hereinafter as Risdon, Pelton, Girard, and as each firm proposes to install two sets of wheels, one set of each make need only be considered in further description and comment. The proposals submitted by the above three firms cover the requirements of the specifications and hence need only more minute consideration in connection with the special means and methods proposed for accomplishing the results required.

Risdon proposes as follows: Single Knight Wheels 48 inches in diameter, 750 H. P. at 257 R. P. M.—199.4 feet head, multiple nozzles gate operated by

hydraulic cylinder for stopping and starting wheels, said cylinder in turn operated by hand levers placed near switchboard or a second set of hand levers near generators and an extra plain gate to be closed by hand in case hydraulic gate should need repair, water supply to wheel (and hence regulation) effected and controlled by use of the Butterfly valve in pipe leading to multiple nozzles, said Butterfly valve receiving its required movements from a Knight combined mechanical and electrical governor. Water supply to wheel further regulated for large changes of load by a slide back of the multiple nozzles, said slide operated by hydraulic cylinder, which in turn is controlled by hand levers; this slide cuts off power of the wheel in divisions each equal to one-sixth of the full power of wheel, hence in operation under any specified load the slide is moved by the attendant until the least number of nozzles is open, which will give more power than is required and the governor through the medium of the Butterfly valve then controls the speed.

Under these conditions of construction, if wheel were operating, for example, under full load (i. e. slides set by attendant with all nozzles open and governor controlling speed by means of Butterfly valve) and if the load be suddenly removed governor will immediately, i. e. in 12 seconds, partially close Butterfly valve, thereby reducing velocity of water at impact and causing an equivalent increase of pressure or water ram in the pipe line back of the Butterfly valve. This resultant water ram is injurious to pipe line and attachments and would be dangerous

to same were its effects not rendered less harmful by the added elasticity of the pipe line due to the addition of an air chamber; again suppose that wheels are running properly at 55% of full load (i. e. with slides set by attendant so that four out of six slides are open and governor controlling speed as before through the medium of Butterfly valve) and that full load be suddenly required of the wheels, governor will then move Butterfly valve to position full open, but as only four nozzles are open at wheel full load cannot be carried at proper speed until attendant shall move slide back of multiple nozzles, so that six nozzles are open (full load requirements).

From the above it will be understood that the above-described methods and mechanisms appear to require and in our opinion do require the close attention of the attendant if sudden charges of load are liable to occur.

Pelton proposes: Single 48 inch wheels 750 H. P., 257 R. P. M., 187 feet head. Multiple nozzles, each wheel supplied with cast iron multiple nozzle, each nozzle of the set having a movable tongue for regulating the area of discharge opening. These movable tongues are moved in unison by suitable mechanism, and may be operated either by hand or by the Replogle Relay Governor which they propose to use in connection with their wheels. By means of a gate operated either by hand or hydraulic cylinder, one or two-fifths or total power of the wheel may be cut off. If hydraulic cylinder is used for operating this gate, it may be controlled from the switchboard or any other convenient location. Regulation of speed



is guaranteed as follows: That the speed will not vary over

3%	From normal with a 10% change of load.
4%	“ “ “ 20% “ “ “
5%	“ “ “ 30% “ “ “
6%	“ “ “ 40% “ “ “
7%	“ “ “ 50% “ “ “

They say that they can improve the above by making larger and heavier fly wheels.

The Pelton device shown on their blue prints and set forth in their proposals has in action the same effect upon the flowing column of water in the pipe line as has been briefly mentioned in connection with the Risdon proposal and the same attention, required by the attendant as there mentioned when load varies from about 60% to full load, will be required in the Pelton construction. That is to say, the main gate will have to be operated by the attendant to open up nozzles not previously in use.

Girard proposes: Two 44 inch wheels and one shaft to develop 750 H. P. at 257 R. P. M. and 190 feet effective head. Buckets cast solid in the wheels. Nozzles made of gun metal and made to templates and interchangeable. The governor proposed is of a similar type and construction as that used on the modern high speed engine, and its parts take a new position with reference to the shaft with every change of speed or load. Its action is quick and has sufficient power to control the valve of a hydraulic, brass lined cylinder, which in turn determines the flow of the water through the nozzles. The nozzles are supplied with a contracting element which is at all

times in balance and will operate the wheel at normal speed from *no load to full load without the necessity of any attention whatever* from the attendant, and it is guaranteed "that there shall not be more than 5% momentary variation when 25% of the power is thrown on or off suddenly."

By a simple device similar to an ordinary plug cock inserted in a branch from the main supply pipe just back of the nozzle, a complete prevention of any water ram in the pipe line is attained. This rotating, balanced valve is connected to the same hydraulic cylinder that operates the nozzles and in such a manner that when the nozzles are contracted this valve is open and the area in cross section exactly equal to the area of contraction of the nozzle opening, and if the nozzles open this valve closes off an area exactly equal to the added areas in the nozzles. The result is that when water is shut off from the wheels, it escapes through this valve, and when more is wanted on the wheels less is allowed to escape, thus attaining a constant flow of water in the pipe line and hence no water ram whatever or the attendant fluctuations of pressure.

They further suggest and propose to supply constant speed motors to operate the exciters independently. This method of giving constant speed to the exciters independent of varying load and speed of generators is important and of practical value in the attainment of the best results electrically.

Having in the above given briefly the points claimed by each of the parties presenting complete proposals, and having given all of their devices care-

ful study from both a theoretical and practical standpoint, we present our opinion on these proposals as follows:

In the special plan under consideration, the mere fact that only such water flows through the pipe line as is necessary to develop the required power at any particular time is not important from the fact that all water not allowed to flow through the pipe line up to its full capacity at full load will in any case be wasted over the waste-way at the foot of the flume. The features demanded in this plan are:

Greatest attainable uniformity of speed.

Quick and certain variations of power to conform to variation of load.

All mechanism of the simplest possible construction and having wearing surface adjustable. Few **parts liable to derangement or breakage** and all made of superior materials and of first-class workmanship.

The whole so devised and arranged as to require the least possible attention from the attendant.

We are of the opinion that the proposal which most nearly fulfills these requirements and many other desirable features of less importance is that presented by the Girard Water Wheel Company, which is by far the simplest mechanical construction—hence greatest freedom from derangement—is entirely self-acting and self-regulating after starting, requires the least attention during its operations, and embodies in our opinion the *best system of governing* that has been presented as adapted to this plant.

If upon careful consideration you should arrive at the same general conclusions as ourselves and deter-

mine to use the proposal presented by the Girard Company, we would recommend that you require of them that the main gate be opened and closed by hydraulic cylinder, having its water supply pipes so arranged that the speed of opening or closing may be properly adjusted to the conditions, and that the levers for its operation be located at convenient positions for attendant. Also that they arrange the pipes leading from the Receiver to the gates to conform to a lower position of the Receiver as now determined upon.

Respectfully submitted,

COBB & HESSELMAYER,

Per C.

[Endorsed]: U. S. District Court, Southern District of California, Southern Division. Geo. J. Henry, Jr., Complainant, vs. City of Los Angeles, Defendant. In Equity—A. 87. Defendant's Exhibit Cobb & Hesselmeyer Report of August 8, 1896, April 1, 1914. I. Benjamin, Special Examiner in Chancery. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Report on Wheels for the Power Development Co., San Francisco, Calif. C. N. Beal, Secy. Aug. 8th, 1896. Edw. S. Cobb.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.



**Defendant's Exhibit Cobb Efficiency Report.**

**REPORT OF EFFICIENCY TESTS**

of

**GIRARD WATER WHEELS, AT**

the Power House of the

**POWER DEVELOPMENT CO., KERN CO., CAL.**

**GENERAL DESCRIPTION.**

The Power Plant of which these wheels form a part consists of two units which will hereafter be known as units #1 and #2 they were designed to be alike in every respect and both units were made and set from the same drawings.

Each unit consists of:—

A. Two 44" Girard Water Wheels mounted on one shaft, but each in a separate casing, and each provided with nozzles where jet cross section may be varied to conform to different loads.

These nozzles are operated by levers and Rocker-arms from an hydraulic cylinder. This hydraulic cylinder also operates a large cylindrical by-pass valve, and is itself controlled from the shaft governor to be more fully described.

B. Forming the driving connection between the Water Wheel Shaft and its load is the governor mechanism, which in appearance resembles a shaft governor, but which in fact, is a transmitting dynamometer; a part of the mechanism of this shaft governor is rigidly attached to the water wheel shaft and a part is rigidly attached to the shaft of the electric generator, which forms the remaining element of the unit.

C. This Electric Generator is known as a 450 K. W. General Electric Three-Phase Alternator. Its exciter is driven by belt from the rim of a heavy fly-wheel which forms the enclosing wheel for the governor dynamometer mechanism above mentioned.

The water for operating the water wheels is led to them under an effective head of 188.06 feet from bottom of forebay to center of water wheel shaft, plus height of water in forebay varying from 3.5 to 5 feet less friction in pipe line a net head of not less than 190 feet exclusive of friction in E. L. C. goose necks and passages to water wheels which loss is to be borne by Girard Water Wheel Co.

In the pipe system leading water to the wheels and as near them as possible is located the above-mentioned by-pass valve, the area of whose outlet is sufficient to allow all the water required by one unit at full load to pass through it into the tail-race before reaching the nozzles at the wheels and its arrangement and connections are such that when the nozzles are full open this by-pass is entirely closed and when nozzles are fully closed the by-pass is wide open, intermediate positions in proportion.

It will be observed that by this arrangement a constant flow of water is maintained in the pipe-line without regard to actual quantity used on wheels.

At certain seasons of the year the water is so loaded with sand and fine float material that its use to operate the above-mentioned hydraulic cylinder was found inexpedient and oil was substituted for this purpose, and arranged as follows:—A supply tank set at a low level outside the power house is charged

with about 40 gallons of oil, which is pumped, by a belt driven plunger pump located on the water wheel bases, into a surge tank located within the power house.

The top of this surge tank is connected to the top of the large air chamber on the pipe line, and its capacity is greater than the whole supply of oil in use. The pumps run continuously with the unit and when all the oil is pumped into the surge tank from the supply tank they, by continued motion, pump air, which keeps up the supply required in the air chamber.

By this arrangement sufficient oil is always on hand in the surge tank, at the same pressure as the water in the pipe-line, for the operation of the hydraulic cylinder, and the spent oil from the hydraulic cylinder returns to the supply tank by gravity to be again used in the same circuit.

THE GOVERNOR DYNAMOMETER, forming the driving connection between the water wheel shaft and the generator shaft is constructed as follows: See Fig. I which is an outline view of the mechanism looking toward the generator, in which A. is the water wheel shaft, upon which is rigidly keyed the double crank; B. having at its extremities the crank pins C. & C' which by means of links D. & D' are connected to swing levers E. & E'.

T. is a wheel having suitable spokes and a flange (not shown) for attaching same rigidly to generator shaft. The swing levers E. and E' are attached to wheel T by pins H and H' and when full load is being transmitted the outer end of these levers rest on or are near to stops V. & V' attached to inner

surface of rim of wheel T. When full speed is attained with no load these swing levers take the positions shown in dotted line at U and U' with their outer ends in contact with or near the inner surface of the wheel rim.

Between the levers E. and E' are strained the springs S and S'. At the points F and F', which are diametrically opposite each other and also midway between the extremities of the two springs S and S', are attached one end of each of two bell cranks (not shown) the remaining ends of which give longitudinal motion, along the shaft A, to a collar or sleeve which in turn, by a system of levers, operates a balanced valve for controlling motion in the hydraulic cylinder, which operates by-pass valve and nozzles.

The above general description of the water wheel units will make such details as are referred to in this report of the test more readily understood.

On a previous occasion a trial was made of the operation of a set of water wheels that had been supplied by the Girard Water Wheel Co., under conditions varying from no load to full load. And measurements of output in useful effect were made by reading the instruments, on the station switch board, that were supplied as part of the plant by the General Electric Co.

There then appeared a wide discrepancy between this quantity of water used or the effective work it should have performed and the actual, effective work output shown by the switch-board instruments even



after liberal allowances for efficiencies had been made.

The discrepancy shown and the lack of faith of the Girard Co., in the form of buckets which they used in their wheels, led them to change that portion of the wheels which contained the buckets and replace them with those portions now in position. After the new wheels were completed and tested by them the Girard W. W. Co., set up the following claims:

1st. That the instrument used in measuring the effective output at the former trial above mentioned, were defective.

2nd. That the shortage of output may have been caused by a much lower efficiency of the generator itself than had been allowed for.

3rd. That their water wheel governor as constructed and applied was a transmission *dynamometer* giving an accurate measurement of the power passing through it to the generator shaft.

4th. That from knowledge at their command, they say that the wheels *do* deliver the required effect to the generator shaft, as was shown to their satisfaction at their own trial above mentioned.

5th. That carefully made tests will prove the accuracy of their claims and,

6th. That they now submit the wheel units for final test under the contract.

#### THE TESTS:

Then, a report of which follows, were made:—

A. To determine the accuracy of their above enumerated claims and B. To determine whether the

guarantees given in their contract respecting all matters of workmanship and material, horse-power of work delivered to generator shaft, and efficiencies of operation at different loads had been complied with.

Their claims as above need not, then, be repeated here; They further by contract dated, Fourteenth day of August A. D. Eighteen hundred and Ninety-six, agree and guarantee as set forth in the following extracts therefrom:

(Page 1) 1st. "All material furnished and all work done by contractor shall be first-class in every respect"; and the contractor shall replace and make good, without extra cost, any defects of workmanship or material which may be discovered within four months after date of final acceptance of the work" by the Power Development Company."

(Page 4) 2nd. "Each unit under normal conditions to be capable of developing and delivering to the shaft of a 450 Kilo Watt General Electric Company's triphase alternator, directly connected with such unit, 750 effective horse-power when operating under an effective head of 190 feet and at a speed of 257 revolutions per minute."

(Page 6) 3rd. "An hydraulic cylinder, which shall open and close the apertures in the contracting and expanding nozzles, and shall simultaneously open and close balanced rotating valves in the conduits in such manner that the flow of water in said conduits shall be uniform at all times when wheels are in operation."

(Page 7) 4th. "Efficiencies:—The contractor

guarantees that the wheels supplied by it will develop and deliver to the generator shafts when operating at full load, three-quarter load, or half load, eighty-five per cent of the theoretical power of the water applied to the wheels; and when operating at one-quarter load, will develop and deliver to said shafts eighty per cent of such theoretical power."

(Page 7) 5th. "The Contractor also guarantees that there shall not be more than five per cent variation in speed of the water wheels when the load for the time being carried is suddenly increased or decreased 25 per cent; and that such variation shall not continue for a period exceeding three seconds."

In consideration of claims 3 and 4 as set up by the Girard Water Wheel Co., it was determined that the first measurements taken should be those necessary to arrive at the correctness of those claims.

This made it necessary to first measure the tensions of the springs in the governor mechanism and these measurements were made as follows with the results there shown. See Diagrams 1 & 2.

Both of the links D. & D' connecting the crank pins C. & C' to swing levers E & E' were removed and lever E' forced to its maximum outward position as shown at U' Fig. 2 and then securely blocked. The wheel T was securely blocked in such position that, when lever E was in position half way between that shown in full lines in Fig. 2 and that shown by dotted lines at V, it was level.

A force was applied at the point O in the direction of the line X. Y. of such intensity as to move the lever out, against the tension of the springs

S. & S', to the position shown by dotted lines at U, when the outer end of the lever E. was as near the inner surface of the wheel rim as would just allow the passage between them of a piece of ordinary writing paper, the force necessary to do this was found to be in measurement #1 1437 lbs., in measurement #2 1428 lbs., average say 1432 lbs.

Both measurements were made by using a long lever, the short end of which was placed under the lever E. at the point O. with a steel plate and piece of round iron as a knife edge; and whose fulcrum was formed by a bar of 1" round iron supported in the load chain of a traveling crane.

This fulcrum was raised, as the end of the lever E. raised, so that lever was always kept in a level position. The following are the details of these measurements, see diagrams.

The above average force at O. multiplied by its leverage about the pin H. i. e., 40.4" and divided by the distance,  $20\frac{1}{4}$ " between pin H, and pin F. will give the force, which acting at the pin F. midway between the springs S. & S' would be equivalent to the above force i. e.—2857 lbs.

Hence 2857 lbs, is the force acting, radially, outward at the pin F. and also at pin F' which will extend the springs S & S' to such an extent that the levers E. & E' will take their maximum outward positions, as shown at U & U' in Fig. 1.

Now when the dynamometer was revolved at 257 Rev. per min. with all parts connected up as shown in Fig. 1, and *no* load is carried by or transmitted to the generator shaft, except a very small power



required to revolve it at that speed, it was conclusively shown that the swing levers E. & E' with their superimposed weights and attachments as shown in Fig. 1 were thrown by centrifugal force, against the tension of the springs, out to their extreme positions as shown at U. & U', which is conclusive proof that, at 257 rev. per min., the weight of levers and their attached parts was sufficient to produce a centrifugal force of 2857 lbs. intensity at the point F. between the springs S. & S'. Now when the levers E. & E' are at their outer-most positions the points F. & F'. revolve in a circle  $27\frac{7}{8}$ " in diameter,  $13\frac{15}{16}$ " radius.

It is now necessary to determine the initial tensions of the springs S. & S' in order that we may know their full effect in retarding the action of centrifugal force in the levers, etc., and this was determined by allowing both levers E. & E' to rest on their stops V. & V' with no other connections between than except the springs S. & S' and a force applied, by lever as in the former cases, at the point O. that was just sufficient to raise the end of lever E. from the stop V. sufficient to allow passing a thin piece of paper, between them. This force applied at O. was found to be 415 lbs. which reduced to find equivalent force required if applied at point F. or F'

$$\frac{415 \times 40.4}{100} = 828 \text{ lbs.}$$

gives 20.25

Now when the levers E. & E' are drawn in so as to rest on their stops V. & V' we have 828 lbs. as the force which is acting radially inward at each point F. & F' to keep them there.

And the points F. & F' revolve in a circle  $24\frac{1}{8}$ " diameter a  $12\frac{1}{16}$ " radius when the system is revolved with the levers in this position.

When the whole is revolved at 257 Rev. per min., the above tests and calculations show that a centrifugal force of 2857 lbs., acts at both points F. & F' when the levers are in their maximum outward position i. e. when the points F. & F' are revolving in a circle  $13\frac{15}{16}$ " radius.

And if the system be revolved at 257 rev. per min. and the levers E. & E. are prevented from moving outward, but are held so that points F. & F' continue to revolve in a circle  $12\frac{1}{16}$ " radius, then the effect of the weight of these levers to produce centrifugal force will be reduced in proportion to the reduced radius of revolution or  $2857 \div 13\frac{15}{16} = 2472 \div 12\frac{1}{16}$ " giving under these conditions 2472 lbs. as the radial, outward centrifugal effect of the weight and levers under the above conditions at 257 Rev. per min.

We have seen that with the levers in this identical position we had an inward pull applied at the same point of 828 lbs. due to initial spring tension. Hence the net outward force acting at the points F. & F' when the levers are in their innermost position and when the whole is revolved at 257 Rev. per min is 2472 lbs. minus 828 lbs. or 1644 lbs.

As the only force which can hold these levers in the above mentioned position under a speed of 257 rev. per min, must be transmitted through the pin H. in the wheel T. which is attached to the generator shaft as before explained, we have (See Fig. 3) line

X. Y. to represent direction of resultant forces which cause wheel T. to revolve in the direction indicated by the arrow, and when parts are in the positions above assumed, this force line X. Y. makes an angle of  $60^\circ$  with the center line of the lever E., and the lever length between this force and the pin R. used as a fulcrum becomes  $7'' \times \cos 30^\circ = .866 \times 7'' = 6.06''$  from which, we have, the following  $1644 \times 13.25'' = 6.06 \times \text{force acting in line X. Y. or force acting in line X. Y.} = 3594 \text{ lbs.}$ , and as this identical tangential force is acting on two points of a circle 4 ft. in diameter, we have as the foot pounds transmitted under these conditions.

$$3594 \times 2 \times 12.56 \times 257 = \text{H. P. transmitted} = 703.1.$$

---

33000

In further consideration we will call the length of the line drawn through pin R. normal to force line X. Y., the *Back Lever* length which must of course vary as the levers are thrown outward from the position above discussed.

And when the levers are at their extreme outward position this "back lever length" becomes only 5.7" by reason of the different angle thus formed between center line of lever E. and force line X. Y.

From carefully made tests it has been shown that the springs used give practically equal extension for equal addition of load and hence we are, by reason of this fact and in accord with the results of the above described tests, enabled to construct the following table of, Horse-Power transmitted, when Dynamometer levers are in different positions be-

tween *no load* and full load and when revolved at 257 rev. per min. See table #1.

Before proceeding further with tests of the complete unit, under various loads; it was determined to test this variation, if any, in readings given by the instruments on the switch board, for this purpose there had been provided by the General Elec. Co's. Engineers, one Weston Calibrated Ampere-meter reading to 200 amperes and one Weston Calibrated Volt-meter measuring to above 600 volts.

Three of the Ampere meters were put in the same circuit with the Standard Ampere-meter and the following table gives the readings of the several instruments at the same instant of time.

All Ampere readings above 200 were read only on the Station instrument as the Western Ampere-meter reached its limit at 200 Amperes.

#### TABLE #4—

It will be observed that no two instruments read alike and no one like the standard, also that variations of reading were not constant so that the probable error could not be calculated and provided for.

Under these conditions it appeared best not to rely upon these instruments in determining the power output of the water wheels, but instead to use the dynamometer readings as shown in Table. I. as the more accurate measure of the actual work done.

In order that the exact position of the swing levers E. & E' should be accurately determined and automatically recorded for any particular load for which such reading was desired, the following de-



vices were employed: See Fig. 4 where T. is the rim of the wheel enclosing the dynamometer levers of which one, E' as shown was used. Attached to lever E' was the spring pencil X., so arranged as to perfectly rigid except in a direction normal to side of the wheel rim.

The post Z. was arranged so that its outer end was much further from the wheel rim than all other near-by parts and between this post and the spring pencil X. a thread could be stretched to hold pencil off of paper when desired. Positions of parts were such that if the pencil was held off of the paper by thread as above described and when the whole was in revolution, the thread could be cut by simply holding a knife in the path of its revolution and the pencil thus allowed to drop onto the papers.

Across the paper at K. is drawn a line radial from the pin H' Fig. 1. and at a distance from it, equal to the maximum travel of the pencil is drawn another radial line m.

The pencil will be at the line K. when the dynamometer is carrying full load or when it is not in revolution, and will be at the line m. when dynamometer is revolving at full speed but transmitting no power.

It must now be understood, that if the pencil is always allowed to stand in contact with the paper, when the machine was at rest it would be found at line K. and then as speed was attained it would travel outward toward M. reaching that line when speed had reached 257 rev. per min., if no load was transmitted, if now load be added, the pencil would

return in the same line toward line K. again a distance in proportion to the load being carried.

Hence, during the tests a description of which is to follow, the unit was stopped after each set of readings had been made and a thread applied to hold the pencil X. off the paper until such time as that load had been applied the measurement of which it was desired to record. Also for each test the pencil was so adjusted as to draw a fresh line on the paper as shown in Fig. 4 where a. represents the length of line for no load transmitted,

b. represents the length of line for  $\frac{1}{4}$  load transmitted,

c. represents the length of line for  $\frac{1}{2}$  load transmitted,

d. represents the length of line for  $\frac{3}{4}$  load transmitted,

and f. being only a point in the line K. shows full load transmission.

And when once the pencil had been allowed to fall upon the paper the load was not removed until revolution had ceased, hence the length of the line drawn on the paper (for example the line d.) represents that part of the whole possible load that was *not* being transmitted at the instant the pencil was allowed to rest upon the paper (in this example the line d. being  $\frac{1}{4}$  as long as possible between lines K. & M. shows that the least power being drawn was  $\frac{3}{4}$  of full load). This measurement made as above is that given under "Arm swing measurement" in Table 2.

For measuring the water used by water wheels, a

weir had been built, at some distance from the power house, at such height that a considerable depth of water was maintained in the tail race. And special care was taken to note, that at no time did the water reaching the weir have what is technically called initial velocity.

The water, which at all loads, except full load, escaped from the by-pass valve was piped away from the tail race. Eight carefully conducted trials were now made of the wheels and generator output as recorded by the several devices and instruments and the readings of these trials are given in #3 to #10 inclusive Table #2.

These being the trials made when the water rheostats were in use to produce load.

#3 & #8 were as near as may be  $\frac{1}{2}$  load trials;

#4 & #7 “ “ “ “ “ “  $\frac{3}{4}$  “ “

#5 & #6 were as near as may be full load trials  
while

#9 & #10 “ “ “ “ “ “  $\frac{1}{4}$  “ “

There appears to be an inconsistency in the water readings of these two latter trials which did not appear at the time the readings were taken and only appeared when reduced to tabular form.

The readings of the heads causing flow at the weir were reduced to Water Horse Power as follows:

The lip of the weir was 125.85 inches long and without end contractions. The Francis formula

$Q = .41 h^{3/2}$  was used wherein,  $h^{3/2} = V h^3$

$Q$  = quantity of flow in cu. ft. per min.

$l$  = length of lip of weir in inches

$h$  = head causing flow in inches, hence

$Q=.41 \text{ h } 3/2$  becomes  $Q=50.34 \text{ h } 3/2$

Pressure gauges applied to pipe-line as near as possible to centers of wheels give pressure of 82. lbs. As the water was supplied, however, at 190 ft. head we have one cu. ft. of water per min.=.359 H. P. and the above formula gives H. P.=.359 x cu. ft. per min.=18.07 h  $3/2$  from which column O. in table 2 and column U. in table 3, were calculated.

Table 3, shows the, Horse Powers, calculated for the different parts of the unit tested, from the data given in "table 2." and also in column W. gives the efficiency of the water wheels under different loads when dynamometer measurement was taken as the Horse Power output, column U. and theoretical water horse power was as given in column V.

Tests were then made to determine the variation of speed attendant upon changes of load and the results of these observations are set forth in the following table:

TABLE 5.

5/16 load raised suddenly to 7/16 load tachmeter readings minimum 250 to maximum 260; 7/16 load raised suddenly to  $1/2$  load tachmeter readings minimum 248 to maximum 260;  $1/2$  load raised suddenly to  $3/4$  load tachmeter readings 245 min. to max. 262;  $3/4$  load dropped suddenly to  $1/2$  load tachmeter readings min. 247 to max. 270;  $1/2$  load raised suddenly to  $3/4$  load tachmeter readings 245 min. to max. 262;  $3/4$  load dropped suddenly to  $3/8$  load tachmeter readings min. 245 to max. 272; Loads changed by changes in water rheostat.



The speed readings during all the tests were taken from a fixed tachometer driven by a belt from pulley on generator shaft.

These tests as recorded in the several tables #1—#2—#3—& #4; then indicate that claims 1 & 3 as set up by the Girard Water Wheel Co., are well founded and true.

In regard to their claim #2, concerning efficiency of generator, no tests were made at this time, former tests made at the factory of the General Electric Co., by Mr. Cary T. Hutchinson, as reported by him, showing such results as to have been satisfactory to the Power Development Co.

In regard to their claim #4, that the wheels do develop the required power; the tests show that the maximum power transmitted through the dynamometer was but 703 H. P. although it is readily believed that the spring tensions and weights can be so adjusted that dynamometer will transmit 750 H. P. at 257 rev. per min, and that power can probably be derived from the wheels as during these tests here recorded, there was still more area of nozzle opening to be used had it been required.

Considering the guarantees as set forth in the contract with the Girard Water Wheel Co., and as stated above in this report. We find from page

1st: From careful inspection of the material and workmanship we find that the material is first-class and that the workmanship is above the average on this class of work, except in the following particulars.

The by-pass valves are not reliable and have so far

given a great amount of trouble and should be replaced by a construction that will render it possible to operate them with certainty by the Hydraulic Cylinder provided in part for that purpose.

The oil pumps for keeping up the supply of oil in the surge tank are driven far too fast, they should be reduced in speed to not more than one-half that now maintained. The present high speed causes hammering in the pipes and is too great when area of valve passages is considered. If reduction of speed as above does not incidentally allow the gears on the pumps to run noiselessly, then cut gears should be provided in their places.

Oil cups suitable for "solid oil" or "cold grease" should be provided and applied to the six principal pin bearings in the governor mechanism.

2nd. The tests show that under an effective head of 190 feet the wheels developed, by dynamometer measurements as hereinbefore set forth, a maximum of 703.1 H. P.

It is believed that the dynamometer can be so adjusted as to measure a transmitted load of 750 H. P. and in our opinion if such adjustments were effected, the nozzles being allowed to open to their full extent, the wheels would develop the power called for in the contract.

As the dynamometer was set during the tests here reported on, 703.1 H. P. was the maximum load. Then, as nearly as we can determine, the following is a correct showing of the efficiencies of the wheels at full,  $\frac{3}{4}$ ,  $\frac{1}{2}$  and  $\frac{1}{4}$  loads respectively:

Full load	—	703.1	H. P.	—	81.2%	efficiency
$\frac{3}{4}$	“	516.0	“	—	78.3%	“
$\frac{1}{2}$	“	308.0	“	—	68.0%	“
$\frac{1}{4}$	“	179.0	“	—	79.6%	“

As previously stated, we think an error exists in the reading of water at the quarter load point and that the efficiency above shown at that point is unreliable.

We are also of opinion that if the dynamometer was set to transmit a maximum load of 750 H. P. the efficiencies at various loads above shown would remain substantially unchanged.

5th: Tests for variation of speed for heavy changes of load as shown in table 5 indicate, that in this particular, the guarantee given has been fully complied with.

Hence, we recommend that when the above-mentioned defects of the by-pass valves and oil-pumps be properly made good and reliable and when dynamometers have been so adjusted that they shall measure a maximum transmitted load of 750 H. P., that these water wheel units be accepted with such deductions as may be mutually agreed upon as a fair allowance to the Power Development Co., as compensation for the fact that these wheels do *not* show exactly the guaranteed efficiencies; or, that the Girard Water Wheel Co., be required to replace these wheels with such others as will show the efficiencies required under the contract.

Very respectfully submitted,

COBB & HESSELMAYER,  
Engineers.

A blue print of Tables, data, etc., accompanies this report.

[Endorsed]: U. S. District Court, Southern District of California, Southern Division. Geo. J. Henry, Jr., Complainant, vs. City of Los Angeles, Defendant. In Equity—A-87. Defendant's Exhibit Cobb Efficiency Report. April 2, 1914. J. Benjamin, Special Examiner in Chancery. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Report Efficiency Tests of the Girard Water Wheels at the Power House of the Power Development Company, San Francisco, Cal. Aug. 24, 1897. Edw. S. Cobb.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.







**Defendant's Exhibit Lamb Patent.**

2—390.

UNITED STATES OF AMERICA,  
DEPARTMENT OF THE INTERIOR,  
UNITED STATES PATENT OFFICE.

To all to whom these presents shall come, Greeting:

THIS IS TO CERTIFY that the annexed is a true  
copy from the Records of this Office of the

Letters Patent of

Newton Lamb,

Number 668,801,                      Granted February 26, 1901,  
for

Improvement in Regulating Devices for Impact  
Water-Wheels.

IN TESTIMONY WHEREOF I have hereunto  
set my hand and caused the seal of the Patent Office  
to be affixed at the City of Washington, this 25th day  
of February, in the year of our Lord one thousand  
nine hundred and fourteen and of the Independence  
of the United States of America the one hundred and  
thirty-eighth.

[Seal]

J. T. NEWTON,

Acting Commissioner of Patents.

2—370.

No. 668,801.

THE UNITED STATES OF AMERICA,

To all to whom these presents shall come:

WHEREAS,                      Newton Lamb,  
of

Yreka,

California,

has presented to the Commissioner of Patents a peti-

tion praying for the grant of Letters Patent for an alleged new and useful improvement in

Regulating Devices for Impact Water-Wheels, a description of which invention is contained in the specification of which a copy is hereunto annexed and made a part hereof, and has complied with the various requirements of law in such cases made and provided; and

Whereas upon due examination made the said claimant is adjudged to be justly entitled to a patent under the law;

Now therefore these Letters Patent are to grant unto the said Newton Lamb, his heirs or assigns for the term of seventeen years from the twenty-sixth day of February, one thousand nine hundred and one, the exclusive right to make, use, and vend the said invention throughout the United States and the Territories thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed, at the City of Washington, this twenty-sixth day of February, in the year of our Lord one thousand nine hundred and one, and of the Independence of the United States of America the one hundred and twenty-fifth.

[Seal]

F. L. CAMPBELL,

Assistant Secretary of the Interior.

Countersigned:

C. H. DUELL,

Commissioner of Patents.



No. 668,801.

N. LAMB.

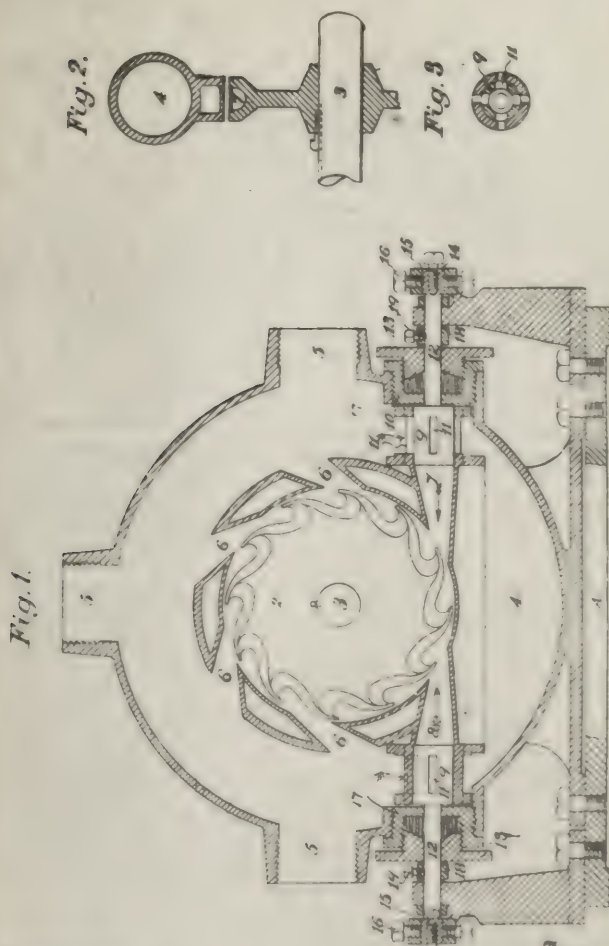
Patented Feb. 26, 1901.

REGULATING DEVICE FOR IMPACT WATER WHEELS.

(Application filed Apr. 2, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses,  
Edw. W. L. Lamb,  
J. W. Lamb.

Inventor,  
N. Lamb,  
J. W. Lamb & Co.  
Sole



No. 668,801.

Patented Feb. 26, 1901.

N. LAMB.

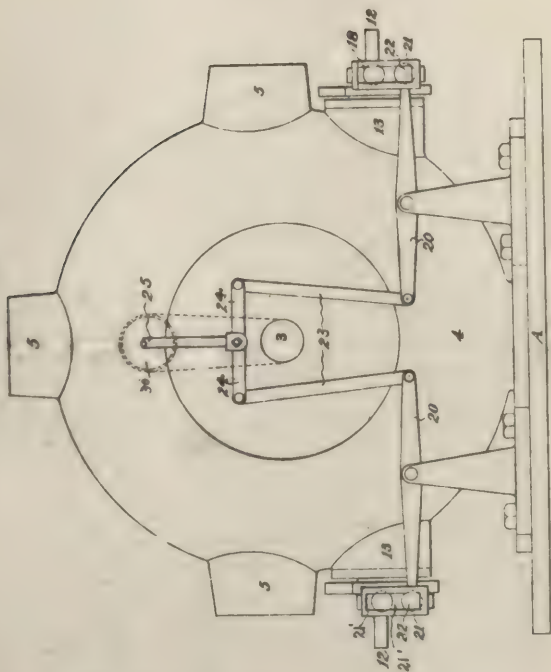
## REGULATING DEVICE FOR IMPACT WATER WHEELS.

(Application filed Aug. 9, 1900.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 4.



Witnesses,

Ed Branda,  
J. H. Moore

Inventor,

Newton Lamb  
Henry Strong & Co  
att.





## UNITED STATES PATENT OFFICE.

NEWTON LAMB, OF YREKA, CALIFORNIA.

## REGULATING DEVICE FOR IMPACT WATER-WHEELS.

SPECIFICATION forming part of Letters Patent No. 668,801, dated February 26, 1901.

Application filed April 2, 1900. Serial No. 11,131 (No model.)

To all whom it may concern.

Be it known that I, NEWTON LAMB, a citizen of the United States, residing at Yreka, county of Siskiyou, State of California, have invented an Improvement in Regulating Devices for Impact Water-Wheels; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in water wheels or motors and governors.

It consists of a plurality of nozzles through which water is directed against peripheral projections upon the wheel by which the latter is propelled, with a reverse nozzle through which water may be directed to retard the wheel, means for supplying water to these nozzles, valves within these nozzles, and means for operating the valves of the driving-nozzles and the valve of the retarding-nozzle reciprocally, so that whatever amount of water is shut off from a driving-nozzle is discharged by the reverse or compensation nozzle, all with and for the purpose of varying the speed and power of the wheel proportionately to its load.

My invention also comprises details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section through the wheel at right angles to the shaft. Fig. 2 is a section of a portion of the wheel, taken at right angles to Fig. 1. Fig. 3 is a transverse section through one of the valves. Fig. 4 is a front elevation of the reservoir and governor connections.

In the operation of wheels, especially that class known as "momentum-wheels," in which the water is delivered into the wheel-buckets under a high head or pressure, it is desirable to regulate the speed of the wheel and make it commensurate with the load to be carried.

In order to effect this, I have shown a system of nozzles so arranged as to discharge water upon the wheel at various points around its periphery, and one or more of these nozzles is provided with a valve actuated by the governor, while on the opposite side is a nozzle to direct water against the advancing side of the wheel, which I call a "brake-nozzle." This nozzle is also provided with a valve which is operated in unison with the valve control-

ling the driving nozzle, so that as the supply though the driving-nozzle is decreased the supply through the brake-nozzle is increased, and by this means the movement of the water in the pipe will never be choked or disturbed, while the regulation will be more prompt than if deflecting-nozzles are used and with a less waste of water, because instead of being thrown away the water will be projected against the opposite side of the wheel to act directly in checking its movement.

The proportion of driving-nozzles to the brake-nozzle may be varied to suit conditions. As at present shown I have illustrated my invention as provided with five driving-nozzles and one brake-nozzle, which will provide for a variation of nearly fifty per cent of the load and that is more than is usually required.

In the drawings, A is a platform or frame upon which the wheel is carried. It may be in the form of a box-frame, so that the wheel-journals will stand low upon it and the wheel may project partially down into the box, and in this construction the governor bearings and supports will also be low and the whole apparatus will be more steady and compact.

2 is the wheel, mounted upon a journal-shaft 3, which turns in suitably-supported boxes at opposite sides, and there is an opening through the frame below the wheel for the free escape of water. Encircling the wheel and separated therefrom a sufficient distance to permit of the introduction of the nozzle is the reservoir or supply-pipe 4. Into this reservoir are openings 5, (there may be one or more), by which the desired head or pressure is admitted. The object of using the reservoir 4 (which *per se* is not claimed as new) to which to connect the nozzles is that it offers a ready means of water connection between these various nozzles. By using a number of these passages the reservoir may be made smaller in size, and the water entering through so many points will have a shorter distance to travel to the wheel-nozzles 6, through which water is discharged into the buckets 7 of the wheel.

I do not limit myself to any special construction of wheel or the buckets therefor, as there are many varieties of these wheels, any of which can be used in conjunction with my invention.

The nozzles 6 pass through the inner rim of the reservoir 4, which surrounds the wheel, as shown, and as many of these nozzles may be employed as desired to direct to direct water into the buckets of the wheel for the purpose of propelling it.

8 is a nozzle opening directly against the advancing face of the wheel and in opposition to one of the nozzles 6. I have only shown one of these brake-nozzles 8, because by the connection of its controlling-valve with the controlling-valve of the opposing nozzle 6 I cut off a supply from one of the direct nozzles and throw a similar amount of water into the brake-nozzle, so that the resistance to the wheel will be sufficient for any reasonable variation of load.

The valves 9 are cylindrical in form, turning in inclosing cases 10 within the reservoir 4, and the valves and casings have ports in the sides, as shown at 11, which may be brought to coincide, so as to admit water freely into the interior of the valves; but by turning the valves with relation to the casing-openings these ports may be cut off or reduced in size to any desired extent, as will be hereinafter described. One end of the valve 9 opens directly into its nozzle 6 or 8, and the other end is closed, and a shaft 12 extends axially from it through a stuffing-box 13, which forms a tight joint with relation to the shaft. The outer end of the shaft has a center against which an adjustable screw 14 may be caused to press, being turned, through threads in its support 15, to a proper bearing and then being locked by screws 16. This prevents the backward thrust of the water causing too much friction on the moving parts.

17 is a bushing which is screwed or fitted in the front end of the stuffing-box 13.

The valves are turned by crank-arms 18, which are secured to the shafts 12 by set-screws 19 or like securing devices, and the crank-arms are connected with oscillating levers 20 by links 21 or other suitable connecting devices. In order to make these parts freely movable and substantially without friction, I prefer to form them with some well-known form of ball-and-socket joint or connection, which will include balls 22 on the outer ends of the levers and operating between socketed blocks 21', of any well-known type, mounted in links 21.

In Fig. 4 the dotted lines passing around the axle 3 and over the pulley-wheel 30 above it represent a simple and well-known arrangement by which power is transmitted by any well-known means to operate a governor, and in practice the valves 9 are intended to be controlled by some well-known form of governor (not shown) through a rod 25. Thus a lift or depression, as the case may be, of the rod 25 operates to move the valve of the driving-nozzle and the valve of the brake-nozzle simultaneously. In practice it should be understood that when the valve of the driving-nozzle is open that of the brake or

retarding nozzle is closed, or vice versa, so that through the action of the governor on the rod 25 as the valve of the driving-nozzle is closed that of the brake-nozzle is correspondingly opened and the same amount of water is being discharged continuously from the reservoir, though with varying effects of power. By the simultaneous movement of the valves, as shown, compensation is made for the immense pressure that would otherwise suddenly be put upon the mains and reservoirs if the valves worked independently, though the time between the shut-off of one and the turning on of the other occupied but the fraction of a second. This feature of compensation and of controllable distribution of pressure, water, and power is the essence of my invention.

When the wheel is running, water is admitted through all of the driving-nozzles into the buckets of the wheel and the wheel is rotated by the impact of this water. The water escapes at each side of the wheel, which is open for that purpose in the usual manner of this class of wheels. When the wheel reaches the speed at which it is designed to run, the governor will commence to close the inlet-valve which controls one of the supply-passages and, acting through the connecting-levers, will correspondingly open the brake-valve, thus allowing water to enter through this valve to the nozzle 8, which, acting directly against the advancing wheel, retards its motion. As soon as the motion of the wheel is reduced or begins to fall below the desired rate of speed the position of the valves will be again changed by the action of the governor, and thus the speed can be maintained.

It will be manifest that other forms of valves may be used and that various connections between the governor and the valves may be employed without altering the character and operation of the device, which is also applicable to any class of pressure-wheels.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a water-wheel, a nozzle through which water is delivered to propel the wheel, a second nozzle directed oppositely thereto, means for connecting said nozzles, valves for controlling the supply to said nozzles and controlling means connected with each valve and operating the valves to simultaneously open one and close the other.

2. The combination with a water-wheel, of a nozzle at one side of the wheel and through which water is supplied to propel the wheel, a second nozzle at the opposite side of the wheel to retard its motion, means for connecting the nozzles, valves within said nozzles, and means connected with each valve to simultaneously open one valve and close the other.

3. The combination with a water-wheel having peripheral buckets, of a nozzle through which water is projected to propel the wheel,

a second nozzle opposing the first-named one and adapted to retard the movement of the wheel, means for connecting the nozzles, valves for controlling the admission of water to the nozzles, and means including fulcrumed levers and link connections between the valves and arranged to simultaneously open one valve and close the other.

4. In a motor the combination of a journal-shaft and a water-wheel having peripherally-attached-buckets, and encircling reservoir, or supply-pipe, a nozzle attached thereto so as to discharge against these buckets and propel the wheel, and another nozzle in this reservoir so placed as to discharge oppositely against the wheel and retard its motion, valves within these nozzles, connections by

which the valve of the driving-nozzle may be closed or opened simultaneously with the opening or closing of the valve of the retard- 20 ing-nozzle, whereby as an amount of water is cut off by the movement of the valve at the driving-nozzle, a corresponding amount of water is discharged through the retard- 25 ing nozzle without extra strain upon the mains and reservoir and whereby the speed of the wheel and the power generated therefrom are regulated.

In witness whereof I have hereunto set my hand.

NEWTON LAMB.

Witnesses:

LOUIS NEHRBOSS,  
J. A. WINSELL.

[Endorsed]: U. S. District Court, Southern District of California, Southern Division. George J. Henry, Jr., Complainant, s. City of Los Angeles, Defendant. In Equity—A-87. Defendant's Exhibit Lamb Patent. Apr. 2, 1914. I. Benjamin, Special Examiner in Chancery. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monekton, Clerk.







brevet de quinze ans )

du 8 août 1899

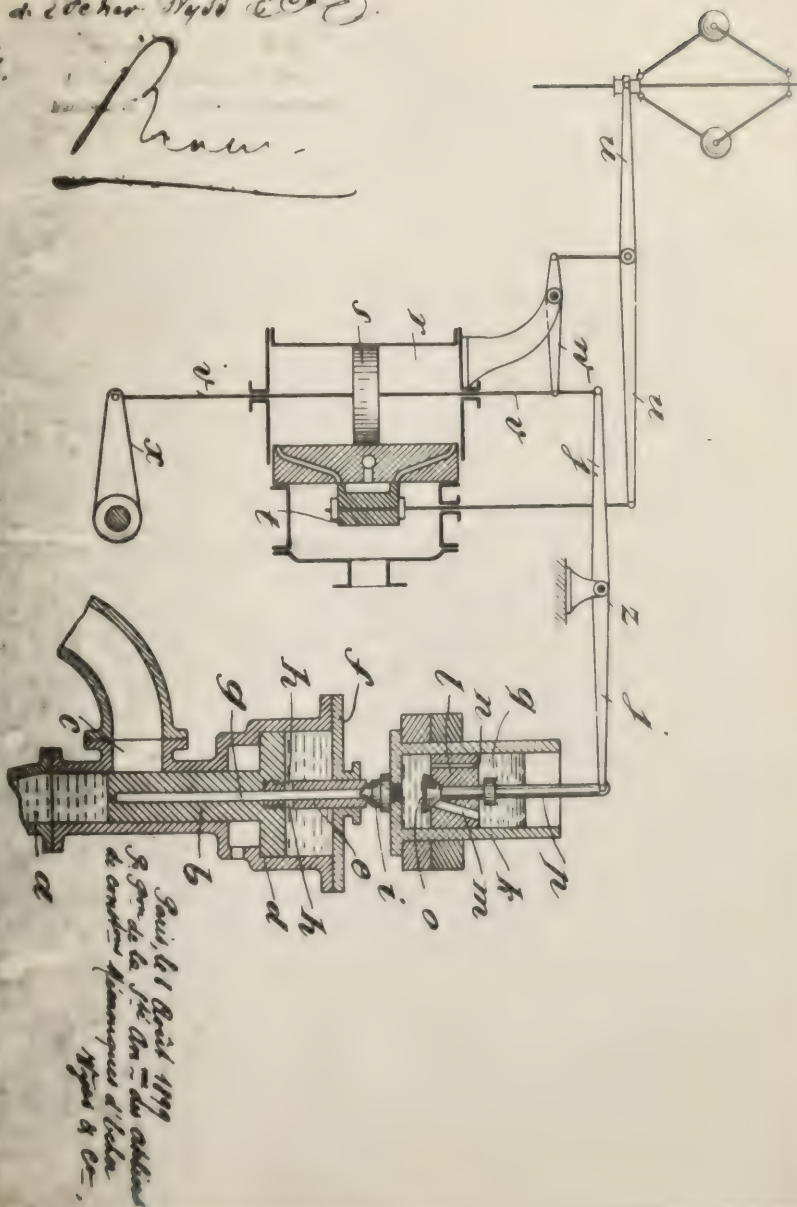
pour la <sup>re</sup> anonyme des Ateliers

de Construction mécanique

de Echever Wyss & Co.

Fig.

Renner.



Brevet du 8 Août 1899  
 pour la <sup>re</sup> anonyme des Ateliers  
 de Construction mécanique d'Echever  
 Wyss & Co.



**Defendant's Exhibit Translation of French Patent.**

**FRENCH REPUBLIC.**

**ADMINISTRATION OF COMMERCE AND  
INDUSTRY.**

National Conservatory of fine arts and trades.

National office of industrial property.

Official copy of a patent of invention issued under the  
number 291588.

Descriptive memorandum adjoined to the patent of invention, of fifteen years, taken August 8, 1899, by the machine factory of Escher, Wyss & Co., incorporated, represented by Mr. Bletry, Senior, 2 Boulevard Strasbourg, Paris, and which was delivered to him by order of the Minister of Commerce, Industry, Post and Telegraph the 23 day of November, 1899, for a self-regulating by-pass for the water-wheel.

Our invention concerns a self-regulating by-pass for the water-wheel with the idea of over-coming the increase of pressure produced by the too rapid changes of the motive power, especially in long conduits. For this purpose one places at the water-gate a diversion, provided with a closing body, connected by a combination of levers to the governor. By this arrangement when the water-supply to the water-wheel is interrupted by the governor, the by-pass opens and closes slowly, so that the re-tained water at the gates of the water-wheel and the resultant increase of pressure are diverted through the open by-pass. The design demonstrates the construction of the by-pass, partly in vertical section and partly in *diagramatic* view.

At the entrance of the water-wheel, the by-pass A is placed on the feed-pipe; in the pipe A is moving a differential piston B, which regulates the orifice of the flow of the by-pass. The differential piston B is placed in a vertical cylinder, the larger pressure surface of which is at the top; the said piston is guided through the bottom of the cylinder F by the rod E of the piston. All through the length of the differential piston and the piston-rod runs a narrow bore G, which opens on the outside of the cylinder at the end of the piston-rod and inside of the cylinder by means of side openings H cut through said rod. The bore G establishes a connection between the chambers above and below the piston. Over the opening of the bore G outside of the cylinder is placed a closing apparatus I, fixed to the bottom of the cylinder of an oil regulator K. In this regulator moves a piston L which is equipped with two bores a wide one M, and a narrow one N; the latter gives permanent communication between the chambers above and below the piston. The wider bore, when the piston rises, is closed at the bottom by means of a valve formed by a collar O, on the piston-rod P, placed vertically and on which the piston moves with a little play Q in vertical direction.

When the piston descends with the rod, the latter moves slightly toward the bottom, opens the bore M, and *and* the communication between the chambers above and below the piston, is accomplished also by the bore M.

To the piston-rod P is connected a double-arm lever Y which is brought into action by the regular



governor. Said governor consisting as usual in a cylinder R with a piston S and a slide-valve T, is operated by a regulating lever U connected directly to the rod of the slide-valve T by means of an intermediate lever W joined to the piston-rod S. The piston-rod V is connected by a lever X to an admission-valve (moderator) in such a way that when the piston S and the piston-rod go down, the admission-valve of the water-wheel closes. The lever J which is connected at one end with the piston-rod P, and at the other end is joined to the piston-rod V, oscillates on a support Z. As the running of the water-wheel accelerates, the piston-rod V descends and closes the admission-valve, then the lever J lifts the piston-rod P and the regulator of the by-pass works in the following manner:

Through the opening H, the compressed water which rises through the bore G, pours into the chamber above the differential piston and exercising a pressure on a surface greater than the one below the piston, it pushes said piston down and closes the discharge pipe C of the by-pass. This position almost corresponds to the normal run of the water-wheel. The cylinder K of the regulator, which closes the opening of the piston-rod by a valve I, slowly follows the descending movement of the differential piston, and the oil in this cylinder slowly pours through the narrow bore N into the chamber below the piston. When the governor, by means of the moderator (admission-valve) diminishes the diameter of the feed-pipe of the water-wheel the piston-rod V descends as it has been said, turns the lever J on its support and

lifts the piston-rod P. As through the narrow bore N of the piston L the oil pours very slowly, the whole oil regulator is lifted, and the valve I is removed from the opening of the bore of the piston B. Escaping through the opening of the bore E the water diminishes the pressure on top of the differential piston, and consequently the pressure from below lifts the piston B. So the piston B is pushed up and opens the orifice of the discharge which remains open during the time the diameter of the admission-pipe of the water-wheel is diminished. While the differential piston B rises, the piston-rod E meets the valve I which closes again the opening of the bore G, and above the piston B reestablishes the necessary equilibrium.

Whenever the regulating body performs an entire or partial displacement, the differential piston can only follow it in the same proportion, and the opening C of the by-pass opens in proportion to the closing of the water-gate. Consequently the same amount of water issues through the conduit of the by-pass as is refused by the moderator at the water-gate.

As soon as the governor retakes its position which corresponds to the normal run of the water-wheel, the lever J moves the piston-rod P down and said piston-rod having a play, slides in the piston L. In this way it opens the closure of the larger bore M formed by the valve O. The piston L descends in the cylinder of the regulator K, because the oil escapes rapidly toward the top through the larger bore M.

Summary.

1) A self-regulating by-pass for water-wheels characterized in the following manner: the body which closes the conduit of the by-pass is connected by a system of levers to the governor in such a way that said governor opens or closes the conduit of the by-pass according to the opening or closing of the water-gate of the water-wheel.

2) The way of the working of the self-regulating by-pass following the summary 1 is: The closing body is connected to a differential piston, both surfaces of which are sub-mitted to the pressure of water, to produce a rapid opening it is necessary to diminish the pressure on the larger surface. This is afforded by an oil regulator connected to the water-wheel governor in such a way that the rising of the cylinder of said oil-regulator diminishes the hydraulic pressure on the larger surface of the differential piston, and the weight of the falling cylinder produces a slow descending movement regulated by the work of the oil regulator and consequently closes the conduit of the by-pass.

3) A self-regulating by-pass for the water-wheels essentially and in detail as described is represented in the adjoining drawing.

Paris, August 8, 1899, per the machine factory of Escher, Wyss & Co., Incorp.

Signed, C. ELETRY, Senior.

Paris the 9 of February, 1914.

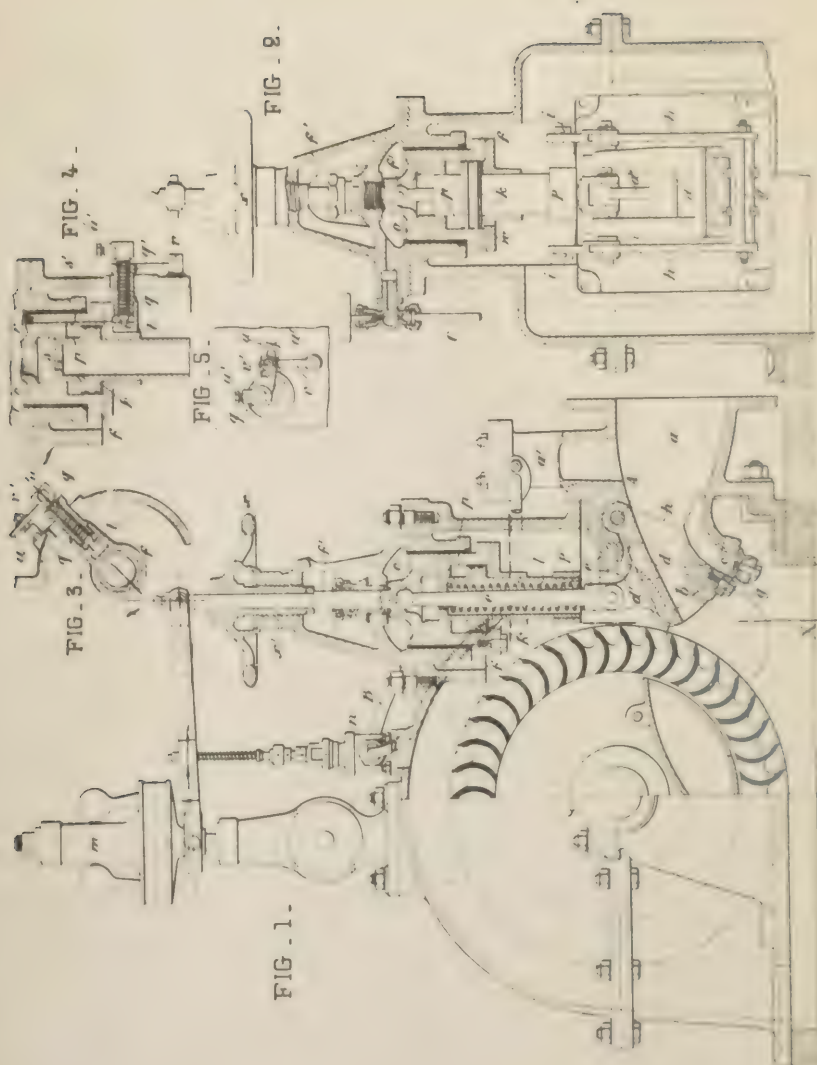
For the certified expedition confirmed.

(Seal) Secretary of the National Office of Industrial Property.

[Endorsed]: United States District Court, Southern District of California, Southern Division. Geo. J. Henry, Jr., Complainant, v. City of Los Angeles, Defendant. In Equity—A-87. Defendant's Exhibit Translation of French Patent—April 1, 1914. I. Benjamin, Special Examiner in Chancery. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.







**Defendant's Exhibit Translation of Swiss Patent.**

**SWISS CONFEDERATION.**

Confederate Office of Industrial Property.

Specification of the Patent.

Patent No. 17536. December 15, 1898, 7 P. M.

Class 93.

Irené Schaad, Kriens near Lucerne (Switzerland).

Mechanism for the automatic regulation of the by-pass at high pressure water-wheels.

The subject of the present invention is an automatically regulated by-pass for high-pressure water-wheels with the idea to avoid the impact of the water in the conduits, resulting from the sudden closing of the water-gate. A high-pressure turbine with an automatic speed-regulator answers the demands of modern industry only when it is provided with a fast working "servomotor." At water-wheels with or without short conduits, the said servomotor has a bad effect on the relation between the pressure and velocity, while in long conduits with high pressure, the thing becomes dangerous.

This evil was formerly partly avoided by inserting into the pipe a pump-kettle, putting on fly-wheels on the water-wheel shaft or applying a by-pass regulator with oil-brakes.

Pump-kettles and fly-wheels are rather expensive and besides the latter is a power absorber; the by-pass-regulation by means of an oil-brake is not satisfactory because the said brake does not work directly on the regulator-valve and does not regulate the by-pass water gradually, which causes the impact of

water in the conduits, and makes impossible an automatic regulation of velocity.

These evils are removed by the mechanism for automatic by-pass regulation for high-pressure turbines which is the subject of the present patent and a drawing of which is adjoined.

Fig. 1 is a partial vertical section of the invention. Fig. 2 is a partial section through X-X of Fig. 1, while Fig. 3, 4 represent details.

The feed-pipe *a* is provided with two adjacent mouths, the mouth *b* is the channel of the water-flow upon the water-wheel and the mouth *c* with the same maximum orifice is the eduction channel to the by-pass. The former is represented open and the latter closed. The regulating tongue *d*, which is placed on a pivot *z* and connected by a rod *e* which rests on the tongue-head *d'* to a hydraulic piston *f* by means of a pivot *f'*. The slide-valve of the by-pass is connected to a double-arm *p*, fastened to the lower end of the inner hydraulic piston *k*, by means of two angle-levers *h* which rotate on the pivot *A*, and their corresponding bridle-rods *i*. In the bore of the latter on a rod *e* is placed a spring *l*, said spring pressing with one end the forked end *e'* of the rod *l* and with the other the upper part of the piston *k* has the tendency to push the latter up, *i*, *e*, to keep the slide-valve of the by-pass closed. The regulating valve *n* inserted in a pressure water-pipe *B* which issues out of the cap of the feed-pipe *A* and leads into the chamber above the piston *f* to regulate the pressure on top of said piston *f* by means of the governor *M* is regulated in accordance with the velocity. The



rapidity with which the slide-valve *g* is closed can be controlled at will by a regulating screw and the consumption of water accordingly reduced through a converting body *v*. The latter is screwed into the top of the bore *s* in the wall of the piston *f*, and is narrower than the bore *s* which through a side opening *S'* has an outlet into the annular chamber *p* above the inner piston *k* and through a side opening *t* into the turbine-box. At the opening *t* in a screw-nut *q'* placed at the bottom of the piston *f* is applied the regulating screw *q* with a conical tap. At the end of this regulating screw *q* is fastened by a screw *u*2 an arm *u* with a cut *u'*.

Through the cut *u'* is inserted a pin *v'* of a rod *v* fastened to the turbine-box, which gives to the arm *u* a point of support during the upward and downward movements of the piston *f* and regulating screw *q*. By this arrangement is obtained the narrowing or widening of the opening *t* in accordance with the turning of the regulating screw *q* in one direction or the other.

For the purpose of a quick stop of the turbine another water-pipe *C* affords a direct flow of the pressure-water into the chamber *o* above the piston *f*. A hand-wheel *x* placed on a slide *x'* of the piston-rod *f*2 of the piston *f* performs the starting and stopping of the turbine and also to widen or narrow the orifice of the channel *b* to suit the conditions of the time being. A hole in the bottom of the piston *f* allows the escape of the leaking water.

The described by-pass regulator works as follows: Before starting the turbine, the regulating screw *q*

is adjusted at the opening of the outflow bore *t* in such a way, that during the normal run of the turbine the resistance on the spring *l* is somewhat greater than the pressure in the chamber *p* so that the slide-valve can be kept closed.

As soon as the water-pressure in the chamber *o* above the piston *f* is increasing by means of the governor *m*, the tongue *d* is moving down; at the same time the water-pressure in the chamber *p* over the inner piston *f* will be correspondingly higher, and the slide-valve *g* is opened in proportion during which the strain of the spring *l* remains almost unchanged, so that the stream in the conduits while closing the tongue *d* continues the same. If by the influence of the governor the tongue *d* took any other resisting position, the pressure in chambers *o* and *b* has lessened the equilibrium, so that the over-pressure by the spring *l* results, and closes the slide-valve *g*. The suppressed water in the chamber *p*, works like a brake on the rising piston *k* and reduces the speed of the total closing of the slide-valve of the by-pass.

The water-pressure on the regulating tongue *d* is the highest while the said tongue completely closed and lowest while opened; to keep the equilibrium in the same proportion as the regulating tongue is moved toward closing or opening, the governor must produce changes of pressure on the piston *f* to keep the equilibrium.

The closing time of the slide-valve *g* must as little as possible depend on such changes of pressure. That can be obtained by means of the regulating

screw in the following manner; whenever the piston *f* through the increase of pressure in the chamber *o*, is moved down, the regulating screw *q* is turned around in this particular case so that it widens the outflow opening *t*, letting more water through *r* and *t* and by the same decreasing proportionately the pressure on the piston *k*. As a result of the over-pressure of the spring *l*, the piston *k* is raised, and the channel of the by-pass accordingly closed. The outflow opening *t* widens in proportion to the position of the tongue *d*, so the closing-time is almost independent of the increase of pressure in the chamber *p*, produced by the closing of the by-pass channel in proportion to the position of the tongue *d*.

In the opposite case, or when the turbine slackens speed, the mechanism works as follows; by means of the governor, the pressure in the chamber *o* is decreasing, and the following increase of pressure on the tongue *d* opens the water-gate. The by-pass could be already closed or would be closed with the same speed as the tongue is opened.

The relation between the orifices can be previously estimated with all certainty so the automatic regulation of the by-pass is not accidental as it was formerly with oil-brakes and closing with constant speed.

#### Patent claims.

1) Mechanism for automatic regulation of the by-pass for high-pressure water-wheels, which by means of a governor can be operated by a hydraulic servomotor and is characterized as follows;

The entrance to the turbine is provided besides the

water-gate, with a by-pass. In the inside of piston f which is connected to the regulating tongue d is placed under the activity of a spring l a piston k, which is connected to the slide-valve g of the by-pass. The chamber above the piston f which intakes the water through the regulating valve of the servomotor, is connected to the chamber above the piston k by means of a bore s in the wall of the piston f with a side opening s'.

At another side opening t of the said bore s is applied a regulating screw in such a way that the increase of pressure above both pistons produced by the regulating-valve as a result of speed increase of the governor, can narrow the inlet orifice of the water-gate by means of the tongue d, and at the same time open the by-pass channel. In the opposite case or when decrease of pressure on the piston f, produced by the resistance and slowing down of the rotation of the governor, the spring l gets the over-pressure and closes the by-pass channel with also decreasing speed avoiding the impact of the water in the conduits at the fast closing up of the water at the water-gate of the turbine.

2) An arrangement of the mechanism described in claim I by which a regulating screw q, applied to the opening t of the piston f, is connected to a point of support by an arm u in such a way that when the piston moves up-ward and turns the arm u the opening t widens in proportion to the position of the tongue d. That is arranged with the idea of closing the by-pass channel with gradually diminishing velocity independently of the variations of the pres-



sure on the pistons f and k, when over-pressed by the spring l, the piston k ascends.

IRENE SCHAAD.

Represented by A. Ritter, in Basel.

CERTIFICATE.

It is hereby certified that the present specification of the patent issued July 15, 1899, corresponds to the principles, by which is protected the

Patent No. 17536, dated December 15, 1898, 7 P. M. (date of the delivery of the patent-request) and registered May 15, 1899, under the name of Irené Schaad, Kriens near Lucerne (Switzerland).

This patent expired December 15, 1905.

Bern, February 12, 1914.

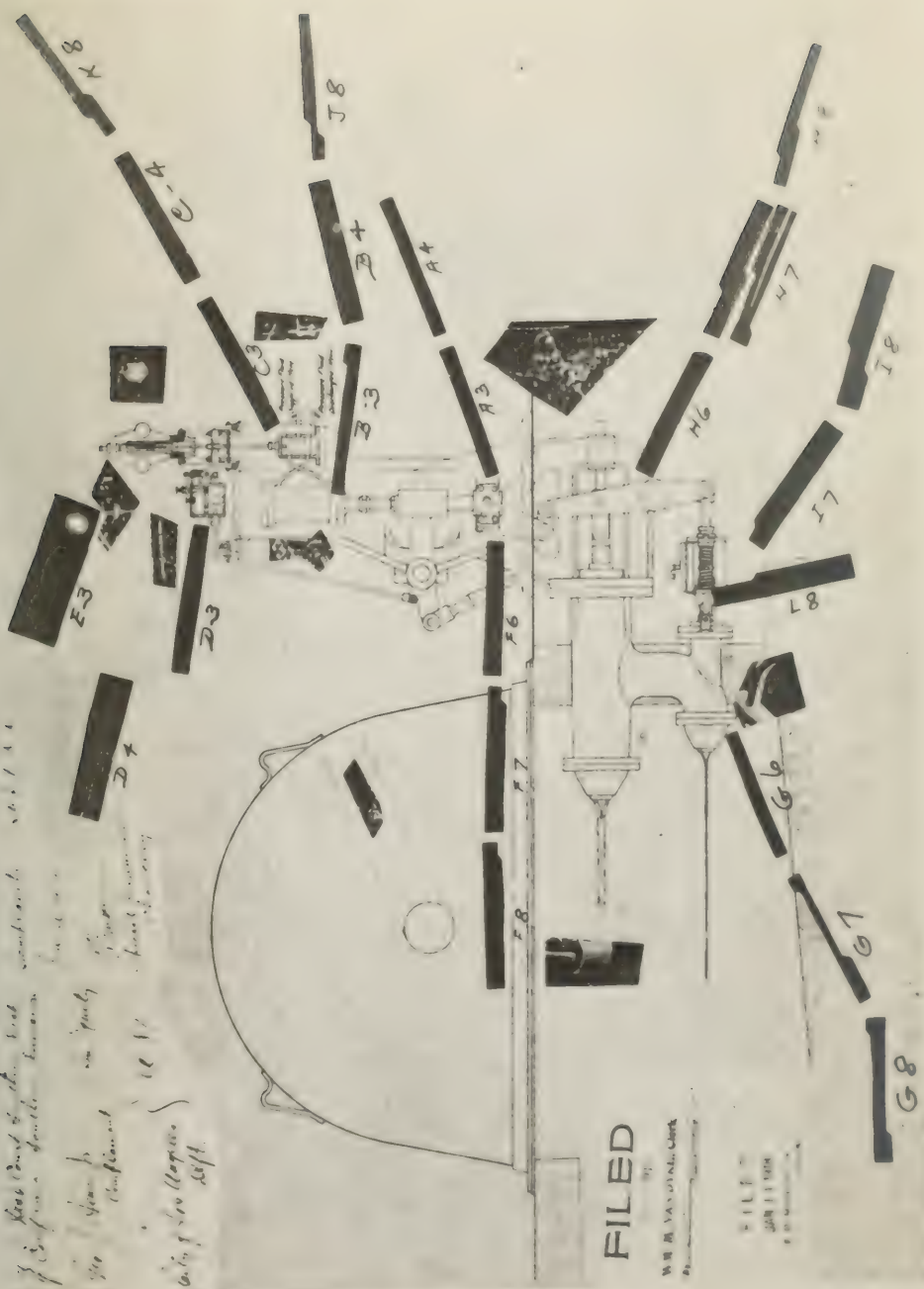
Conf. Office of Industrial Property Director,  
(Signed) HALLEZ.

[Endorsed]: United States District Court, Southern District of California, Southern Division. Geo. J. Henry, Jr., Complainant v. City of Los Angeles, Defendant. In Equity—A-87. Defendant's Exhibit. Translation of Swiss Patent. Apr. 1, 1914. I. Benjamin, Special Examiner in Chancery. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.



3. Best view of the test  
of surface - double known  
400 times by  
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W. H. VAN DYKE, CHAS.

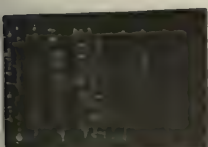
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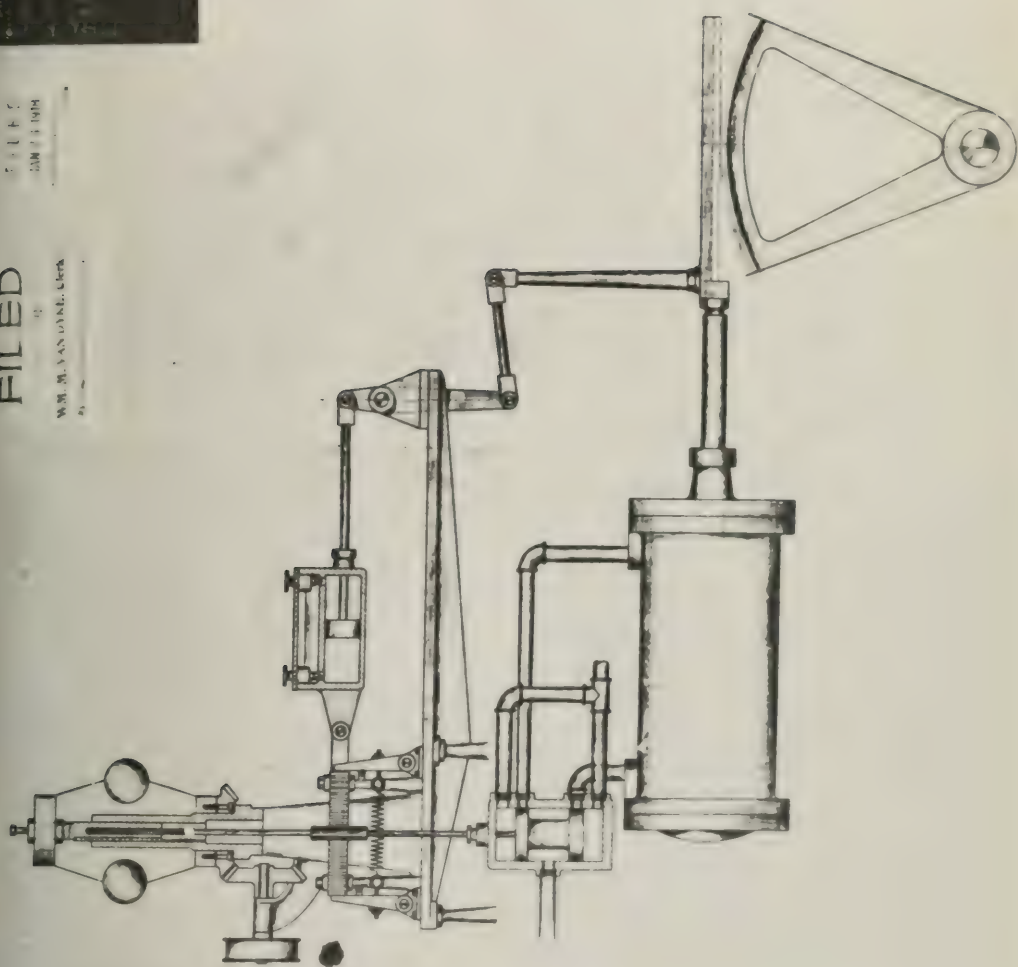






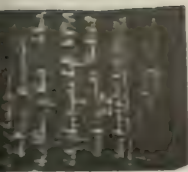


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 W. M. VAN DYKE, Clerk

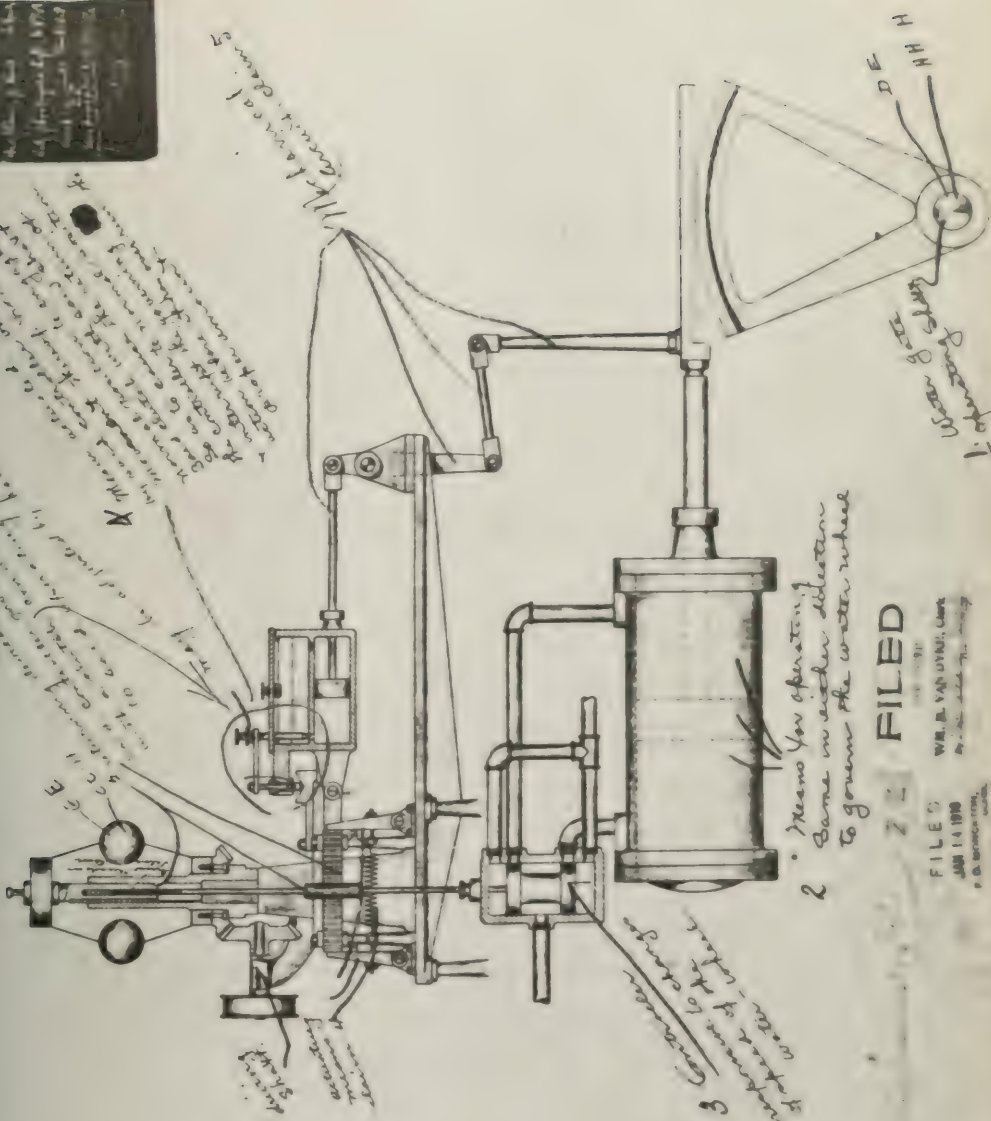








The object of this invention is to provide a means for operating a valve in a water pipe, which shall be capable of being operated from a distance, and which shall be capable of being operated in either direction, to govern the water valve.



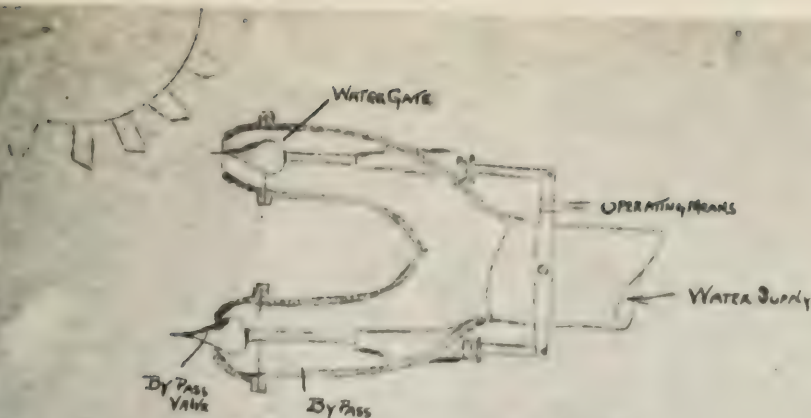
2. Means for operating  
 Same in either direction  
 to govern the water valve

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 W. B. VAN DYKE, CLERK  
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 U. S. DEPT. OF COMMERCE

1. opening  
 Water gate  
 D E H





U. S. Dist. Court Southern Dist. of  
California Southern Division  
Geo. J. Harris, Jr., De Equity  
City of Los Angeles U-87  
Complainant's Exhibit Nelson Sketch A  
Feb 16, 1915

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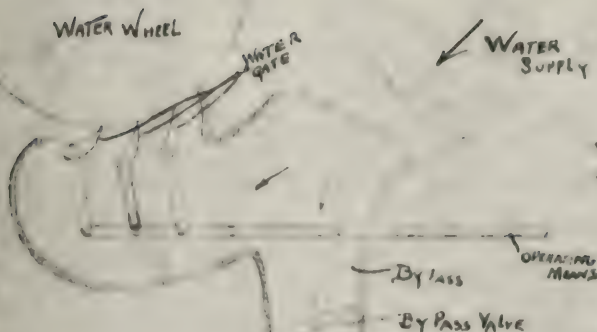
WM. M. VAN DYKE, Clerk

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JAN 14 1918

P. D. MONCKTON, CLERK

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U. S. Dist. Court Southern Dist. of  
California Southern Division  
Geo. J. Harris, Jr., De Equity  
City of Los Angeles U-87  
Complainant's Exhibit Nelson  
Sketch B  
Feb 16, 1915  
J. P. Morgan  
Special Examiner



**FILED**

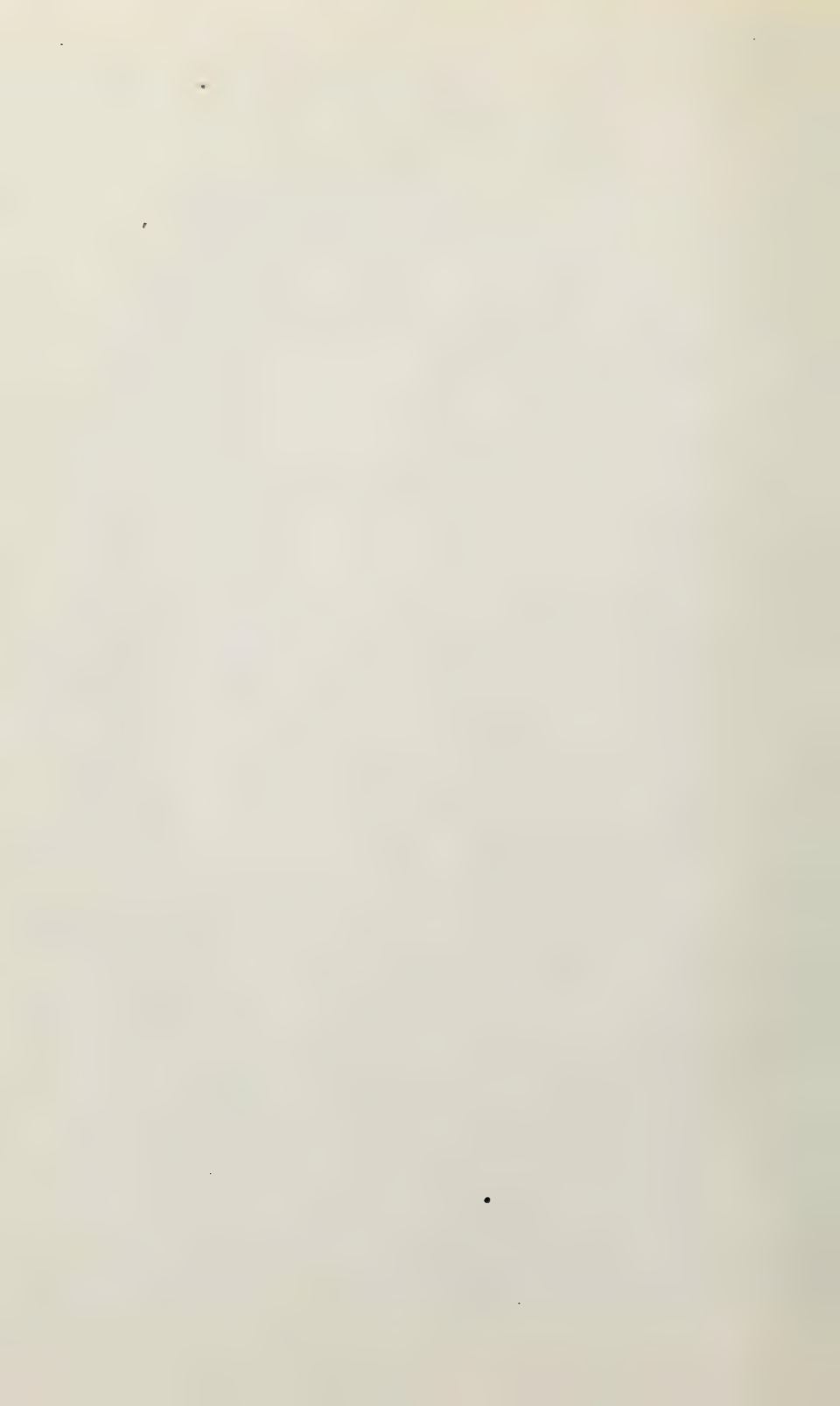
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JAN 14 1918

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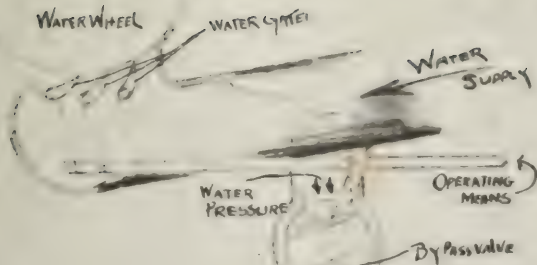
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In the U.S. Dist. Court Southern Division  
 Los Angeles, Cal. Equity  
 City of Los Angeles v. U. P.  
 Complaint Exhibit Wilson  
 Sketch B  
 Feb 9 1915

J. B. Ferguson  
 Special Examiner



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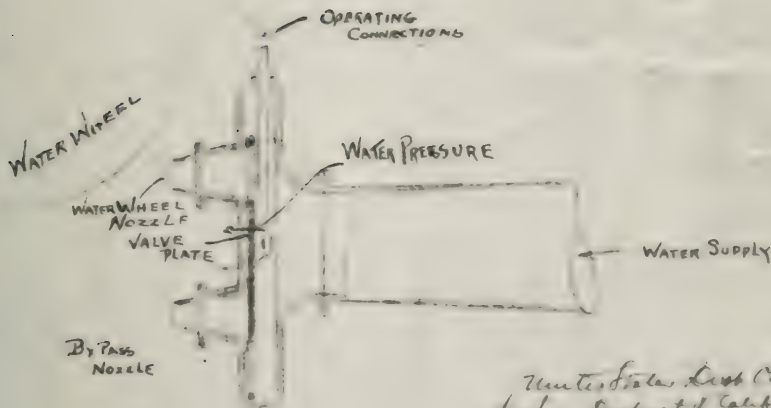
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WM. M. VAN DYKE, Clerk  
 By Special Examiner

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United States Dist. Court  
 Southern District of California  
 Southern Division  
 Los Angeles, Cal. Equity  
 City of Los Angeles v. U. P.  
 Complaint Exhibit Wilson  
 Sketch D  
 Feb 6 1915

J. B. Ferguson  
 Special Examiner

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D



WATER WHEEL

WATER PRESSURE

WATER GATE

WATER SUPPLY

GOVERNING CYLINDER

WATER PRESSURE

By Pass

BYPASS VALVE

U. S. Dist Court, Southern  
Dist. of California Southern  
Division  
Geo. Henry Jr. { At Equity  
City of Los Angeles } A-87

FILED

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By *George A. ...*

FILED

JAN 14 1918

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CLERK

Committed Exhibit Volume  
Spec. Vol. E.  
JST. 16, 1917

Examiner  
F







new building  
old building  
new building

seal outlet

seal



H  
H

D  
D



**Complainant's Exhibit Photograph D.**

[Endorsed]: U. S. District Court, Southern District of California, Southern Division. George J. Henry, Jr., v. City of Los Angeles. In Equity—No. A-87. Complainant's Exhibit. Power Development Company Plant. Photograph D. Feb. 23, 1915. I. Benjamin, Special Examiner. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.

**Complainant's Exhibit Photograph H.**

[Endorsed]: U. S. District Court, Southern District of California, Southern Division. George J. Henry, Jr., v. City of Los Angeles. In Equity—No. A-87. Complainant's Exhibit. Power Development Company Plant. Photograph H. Feb. 23, 1915. I. Benjamin, Special Examiner. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.





A



600

E



sealed  
outlet

2000

10



**Complainant's Exhibit Photograph E.**

[Endorsed]: U. S. District Court, Southern District of California, Southern Division. George J. Henry, Jr., v. City of Los Angeles. In Equity—No. A-87. Complainant's Exhibit. Power Development Company Plant. Photograph E. February 23, 1915. I. Benjamin, Special Examiner. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.

**Complainant's Exhibit Photograph A.**

[Endorsed]: U. S. District Court, Southern District of California, Southern Division. George J. Henry, Jr., v. City of Los Angeles. In Equity—No. A-87. Complainant's Exhibit. Power Development Company Plant. Photograph A. February 23, 1915. I. Benjamin, Special Examiner. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.





I



Supporting pipe

61a

B



Sealed outlet

Sealed

61



**Complainant's Exhibit Photograph B.**

[Endorsed]: U. S. District Court, Southern District of California, Southern Division. George J. Henry, Jr., v. City of Los Angeles. In Equity—No. A-87. Complainant's Exhibit. Power Development Company Plant. Photograph B. February 23, 1915. I. Benjamin, Special Examiner. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.

**Complainant's Exhibit Photograph I.**

[Endorsed]: U. S. District Court, Southern District of California, Southern Division. George J. Henry, Jr., v. City of Los Angeles. In Equity—No. A-87. Complainant's Exhibit. Power Development Company Plant. Photograph I. February 23, 1915. I. Benjamin, Special Examiner. Filed Sep. 16, 1915. Wm. M. Van Dyke, Clerk. By Leslie S. Colyer, Deputy Clerk.

Filed Jan. 14, 1918. F. D. Monckton, Clerk.





No. 3108

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IN THE

# United States Circuit Court of Appeals

NINTH JUDICIAL CIRCUIT

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GEORGE J. HENRY, JR.,

Appellant,

vs.

CITY OF LOS ANGELES,

Appellee.

FILED

JAN 18 1918

F. D. [illegible]

~~Corrected~~

Appellant's Opening Brief

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RAYMOND IVES BLAKESLEE,

Counsel for Appellant.

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IN THE  
**United States Circuit Court of Appeals**  
NINTH JUDICIAL CIRCUIT

---

GEORGE J. HENRY, JR.,	}	No. 3108
Appellant,		
vs.		
CITY OF LOS ANGELES,		
Appellee.		

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APPELLANT'S OPENING BRIEF.

This case comes before your Honors on appeal taken by the complainant, George J. Henry, Jr., from a final decree entered in the lower Court in favor of defendant, City of Los Angeles, dismissing the bill of complaint and awarding costs to defendant. The action was commenced in 1913. The opinion of the lower Court (Transcript, page 61) finds the claims of the Lyndon patent in suit not infringed. The Court does not indicate that any one of the claims is invalid or void, and it is fair to be presumed therefrom that the claims come before your Honors as unanticipated and valid.

The patent in suit was issued to one Lamar Lyn-

don, March 11, 1902, No. 695,220, and relates to governors for electro-mechanical water wheels. The appellant is the assignee of all of the right, title and interest in, to and under the said Letters Patent, to all claims of infringement and rights to recover thereon. The appellee is using, and for some ten years has been using the water wheel governing apparatus set forth in the bill of complaint, both in the construction of the Los Angeles aqueduct, and in the production of electrical energy for distribution to consumers.

The Pelton Water Wheel Company which intervened in this suit and was made a defendant therein, subsequently took a license under the patent in suit and upon stipulation was thereupon excluded from the suit as defendant and intervenor. This company is probably the largest manufacturer of electro-mechanical water wheels in the United States, if not in the world, and a suit brought by appellant against it for infringement of the said Letters Patent was likewise dismissed upon stipulation, after said Pelton Water Wheel Company had acquired the said license for a valuable consideration.

The invention covered by the patent in suit, has been epochal in its effect upon industrial and domestic lighting, heating and cooking, and more particularly so upon the Pacific Coast of the United States, where electro-mechanical energy is generated from the streams having their sources high in the Sierras. Prior to the advent of the said Lyndon invention covered by the patent in suit, there prevailed in this electro-mechanical water wheel art an abso-



lute want of sensitive and accurate speed governing, that is, governing of the generating apparatus, driven by water power, and the result was that fluctuations, often to wide extremes, occurred in the supply of electrical energy produced by any such electro-mechanical generating unit. It will be readily understood that if a greater "load" is put upon a water-driven electrical generator, its speed of rotation will be reduced, thus diminishing the electric voltage output of the unit. The converse takes place upon decrease of load. Thus, in a given electrical system, such as that supplying the many domestic, industrial and transportation needs of a municipality, the shutting down of a factory here, the starting of a trolley car there, the switching on of the lights in a hotel or upon the streets; each would vary the demand upon the generating unit at the distant power plant and affect its speed unless adequately governed.

Before the advent of the Lyndon invention your Honors will doubtless remember that the variations of voltage or potential in the electric lighting circuits often caused disagreeable and trying fluctuations in the electric lights in office and household service. Far more important was the effect upon industrial machinery, which is universally required to operate at a fixed rate of motion.

In mountainous districts, where streams of water are found having a considerable grade or "fall," the water may be taken from the bed of a stream, conveyed in a ditch or flume or pipe along the hillside, and then conveyed over a steep hill in a pipe

line, which carries the water down to the power house. To the end of the pipe is fitted suitable nozzle apparatus for projecting and as may be required, varying, the flowing water under pressure against the blades, cups or buckets of the water wheel. This is the more general manner of developing water power in the mountainous regions of our Western States.

In the Eastern States where Lyndon resided, where the slopes are very gentle, and the water volumes proportionately larger, the fall or head that may be obtained economically in any installation is very much less, and the water is then conveyed in a much larger ditch or flume, and dropped to the water wheel, sometimes in a wooden or concrete or sheet steel chute or penstock, and sometimes taken directly from the bottom of a dam under less pressure or head, but usually utilizing a much larger volume of water, which is then supplied through a series of nozzles around the periphery of the water wheel.

In using mechanical power developed from the water wheel, whether it be the high pressure class known in the art generally as a tangential wheel, or the low pressure class, known generally in the art as a turbine wheel, it is obvious that there will be variations in the mechanical power utilized from the wheel shaft. For example, if the water wheel be used to drive a saw, when the saw is not actually cutting through a log, there will not be as much power required to drive the saw as when it is in a deep cut. The result will be that as the power or

work required from the wheel is lessened, the wheel will increase its rotative speed, and that also of the driven apparatus; unless there is co-incident with the reduction in the power demanded of the wheel, a corresponding reduction in the power of the water supplied to the wheel.

Therefore, if we desire *to retain the speed constant*, we must maintain a balance or equilibrium between the power of the water projected upon the buckets or blades of the water wheel and mechanical power being taken from the water wheel, that is, if we reduce the power demand, we must reduce the water power supplied to the wheel proportionately. If we increase the power demand we must increase the water power supply to the water wheel.

It is old in the art to provide the water wheel nozzle with a gate or gates by which the water supply to the wheel may be reduced or increased.

It is old in the art to provide automatic means for moving these gates. This is clearly stated at the beginning of Lyndon's specifications in the patent in suit (Comp. Ex. A., p.1, l.8) in which he says that—"the governors at present employed to regulate the water supply to the water wheel *in general*, simply operate to open or close the water gate, thereby allowing of the admission of a greater or less supply of water."

The manner in which this was originally accomplished in the art was by driving from the water wheel shaft a device sensitive to speed, for example, similar to the fly-ball governor on steam engines, too well known to require detail description. Upon an

increase of speed the fly-balls would travel outward describing in their revolution a greater circle. Upon a decrease of speed they would move inward, describing a concentric but smaller circle. The inward and outward movement of the fly-balls may be used to shift a valve, or other means setting into operation devices which would move to open or close the water wheel gate. But in controlling steam the inertia effects of water are not met with.

No material difficulty was found in the development of a governor to accomplish this purpose. It is obvious that, when the governor moved to close the gate, a less water quantity was flowing into the water wheel; that the water cut off by the gate would be reserved in the pipe, or dam, or in the reservoir which fed the pipe, and would thus be available for later use by the water wheel.

Water economy considered alone was therefore attained by this form of water wheel control.

It is further obvious that in order to prevent the speed of the water wheel from exceeding the normal speed, when the mechanical power required was reduced, as for example, when the log is cut through by the saw and the water wheel runs free, that the water wheel gate or gates must be, instantly, with said reduction in power, shifted to a position corresponding with a proportionately less use of water. The saw runs out of the cut in probably one-half second of time, it is therefore necessary that the gates be shifted from nearly wide open position to nearly closed position in one-half second of time. To move a gate of any considerable size, in one-half



second of time with the water pressure behind it, requires an enormous effort.

In large installations today, very many thousand foot pounds of work are required to move the large gates.

Water wheel governors are therefore built of very heavy and substantial parts, and must be extremely sensitive to speed variations so as to set into operation instantly the heavy machinery necessary to shift the water wheel gates.

When the water wheel gate is shifted quickly, cutting off or reducing the flow of the water through the water wheel gates, the water back of the gate in the pipe or penstock crowds forward, due to its inertia and in its efforts to continue its flow through the closing gate the pressure and velocity with which it is ejected through the nozzles is momentarily increased, and if the gate closing movement has been quick, this increase in pressure becomes very great, causing in practice, in improperly designed, adjusted, or operated apparatus, a break in the pipe line and *very great damage*. This effect is called *water ram*, its cause being the sudden checking of the water.

It is, therefore, extremely necessary that the security of the pipe line be guarded in every way against this inertia effect of water ram.

“Inertia in the art is that property of matter by virtue of which it retains its state of rest or of uniform rectilineal motion so long as no foreign cause changes that state.” (Century Dictionary.)

The inertia effect which is apparent upon the

closure of the water wheel gates and manifests itself as increased pressure, or what is commonly known as water ram or water hammer, is familiar to all of us in the "knocking" in the pipes when we close a faucet or other water gate.

The movement of the gates must be at the same rate and to the same degree as the power demanded from the wheel; that is, if we feed a log up to the saw, at the instant the saw enters the cut, we must commence to turn on water, and we must have the full water quantity flowing by the time the saw has fully entered the cut, otherwise, the speed of the wheel and saw will be reduced.

It is therefore necessary to open the gates with extreme rapidity—in this example—practically within one-half second of time.

If the pipe line be extremely steep, the water in the pipe will quickly respond on the opening of the gate and supply the requisite additional power to the wheel, because gravity will more quickly increase the velocity in a steep pipe than in one laid on a gentle slope, just as a train of cars will increase its speed more quickly on a down grade than on a level.

It is also clear that if we are to move the gates of the water wheel in a closing direction quickly to reduce the quantity of water flowing to the wheel, we are restrained from closing the gate at a rate that will cause a dangerous pressure rise or water hammer in the pipe line, and if we are to open the gates of the water wheel or turbine quickly, we are restrained from doing so at any faster rate than the water in the pipe will accelerate or increase its

velocity due to the action of gravity. These restraints are put upon us by the *inertia* of the water. They have been well known in the art from the earliest time.

The Century Dictionary definition of "inertia," given above, may be considered to be one of the fundamental laws of nature.

Mr. Lyndon did not discover this law, neither did any of the inventors referred to in this case, it is and was public knowledge.

The economy of water effected by holding back in the pipe line or reservoir that water which was not required for power when closing the water wheel gate was not discovered by Mr. Lyndon or any of the inventors or references in this case, but this was and is public knowledge.

*Mr. Lyndon was the first, however, to successfully govern by correcting for the effect of the inertia of the moving column of water in the pipe line.*

*Italic's generally are ours.*

### LYNDON'S INVENTION.

Before Lyndon's teaching, governors were not allowed to move the gates quickly (or the pipe would burst and the plant be wrecked). Lyndon's introduction of an inversely operated bypass actuated by the governing means made possible for the first time—the *rapid* movement of the water gate to the required new position—thus catching the speed before it had changed.

The "time element of the main gate and water wheel" was before, the controlling factor. This Lyn-

don removed from the water gates and wheel and took care of it in the by-pass (Comp. Ex. A., Lyndon patent, page 4, line 96). He provided the way to operate the water gates with any desired degree of rapidity without over-running, and this without interference by the inertia of the water, which was taken care of in the by-pass as actuated by the governor.

We contend that Lamar Lyndon, took the inventive steps which made electro-mechanical speed control the success that it is today and complied fully with the law to secure patent protection afforded by the statutes.

*Lamar Lyndon was the first to conceive and disclose to others and apply for a patent thereon; of a combination of elements for accomplishing the automatic regulation of the speed of water wheels and turbines under the varying conditions met with in modern practice, so as to secure the regulation of the speed within sufficiently accurate limits to meet the requirements of modern electro-mechanical transmission service.*

Lyndon was in these respects a pioneer. Successful governing under the requirements of modern service was not accomplished before.

He pointed the way to securing in a water wheel governor—"the automatic return of the controller to normal position to interrupt the governing action before it had over-run," that is, the introduction of means such that the governor when in the act of moving the water gate to a new position would be prevented from moving the gate a little too far, and



then later moving it back a little further than necessary; this previously existing defect resulted in the governor making a number of successive movements, usually of reducing amplitude, but causing the speed to vary first one side and then the other of normal before the accurate speed was finally found and held. *The Lyndon device eliminated these oscillations.*

This "hunting" of the governor for its correct speed called by Lyndon *over-running* of the governor (and of the water wheel speed) was a very disturbing element in the speed control of the earlier wheel and resulted in an erratic, unreliable and damaging speed variation to the driven machinery, and in the case of electro-mechanical water wheel governing resulted in the voltage, or potential on the electric transmission lines raising and lowering a number of times, and consequently an intermittent intensity of brightening and dimming or darkening of the electric lights served therefrom. This was a common defect in 1900 until the use of Lyndon's invention.

At times, this over-running of the governor would cause serious speed fluctuations resulting in the wrecking or burning out of the driven machinery, and unless safety means were used on the pipe line, would also result in damaging stresses in the pipe due to the over-running or oscillatory movement of the water wheel gates affecting the water flow.

*The by-pass combination, is broadly and basic-*

*ally claimed in Claims 6, 7 and 8 of the patent in suit.*

*The combination preventing over-running is broadly claimed in Claims 3 and 4 of the patent in suit.*

The infringing structures clearly contain and utilize "the substance of the invention," within the meaning of the leading and controlling cases, such as the decision of this Court in *Stebler vs. Riverside Heights, et al.*, 205 Fed. 735. It is true that the invention has been clothed in different raiment by the defendant, but that will not escape infringement where the substance of the invention is taken. All that is required under section 4888 U. S. R. S., is that the inventor disclose and picture and describe the best form of the invention known or occurring to him at the time he makes application for patent, but his claims cover the full length and breadth of his addition to the art and another will not be allowed to take the invention of the combination claims, the very entities which are novel, and dress them up in different form and thereby escape infringement.

*The United States Patent Office has placed its seal of approval on Lyndon's claims in the broadest possible language (3, 4, 6, 7 and 8) in the patent in suit and awarded exclusive rights thereunder.*

These claims were allowed substantially as presented by the applicant, as will be evident from examination of the file wrapper and contents (Comp. Ex. Lyndon file wrapper and contents). This intention of the inventor and the coincident

intention of the Patent Office resulting in the issue of this broad patent is highly significant, and such joint intentions have of course been generally approved and adopted by the Courts, as see

Crawford v. Heysinger, 123 U. S. 602, 1887;

Trader v. Messmore, 1 Bann. & Ard. 639, 1875;

Bate Refrigerating Co. v. Eastman, 24 F. R. 649, 1885;

Williams Rubber Shoe Co., 49 F. R. 251, 1892.

As the Courts have said, it is proper to look through the disguises of an alleged infringement, and if there is thus disclosed a structure which coincides with the invention, in all reasonable respects, infringement must be found, *unless the inventor has disclaimed any breadth of invention*. The Courts have said upon this heading:

“Unless there are limitations written into the claim or *imposed by the prior art, or by the acceptance of a narrow claim in place of a broad one, in the Patent Office, in order to secure the patent* the inventor is entitled to every form in which his invention may be copied and to a broad construction.”

Hall Mammoth Incubator Co. v. Teabout, 205 Fed. 906.

Also,

“The court will look through the disguises, however ingenious, to see whether the inven-

tive idea of the original inventor has been appropriated, and whether the defendant's device contains the material features of the patent in suit, and will declare infringement even when those features have been supplemented and modified to such an extent that the defendant may be entitled to a patent for the improvement."

Crown Cork and Seal Co. v. Aluminum Stopper Co., 108 Fed. 866.

The very doctrine of equivalents, which as we shall see is unnecessary to apply rigidly in broad combination patents further than as to general principle, speaks for infringement in this case, as it always does where the real invention has been copied. See Walker on Patents, section 350, page 308, 4th Edition, as follows:

"The doctrine of equivalents *may be invoked by any patentee*, whether he claimed equivalents in his claim, or described any in his specification, or omitted to do either or both of those things. The patentee, having described his invention and shown its principles, and claimed it in that form which most perfectly embodies it, is, in contemplation of law, deemed to claim every form in which his invention may be copied, unless he manifests an intention to disclaim some of those forms." (Citing many cases.)

In the case at bar, the whole purport of the patent disclosure and claims, is, we shall see, along the lines of breadth, scope and comprehensiveness such as properly attaches to an invention which precedes all the rest, and the invention which underlies all



that later workers in the art produce, subjects them to tribute within the doctrine of *Railway Co. v. Sayles*, 97 U. S. 554.

*The defendant's structures fall within the clear language of the broad claims of the patent in suit, and even the terminology of the narrower claims finds its equivalent expression in defendant's structures.*

We need not cite any law to your Honors to the effect that when there are distinctions as to scope between claims, such distinctions must be presumed to have been intentionally created and embodied in the patent. If this were not so the claims, each of which in its effect, as the Courts have said, is a separate patent, would amount to mere useless repetition, and all but one would be void.

*The defendant has utilized the Lyndon means for preventing the over-running of the governor, accomplishing just the proper governor movement, and no more or less (as expressed in Claims 3 and 4 of the patent in suit.) The defendant has clearly utilized the by-pass in combination as taught by Lyndon.* That the defendant's structures utilize these broadly claimed combinations and entities to produce *the same useful results, is beyond dispute, and was so found by the lower court* (Trans. p. 68, lines 4 to 8). That the results are produced in substantially the same manner cannot be gainsaid. And that the means are substantially equivalent, within the proper broad interpretation of the claims, certainly must be conceded. A pioneer invention is entitled to a greater measure of reward in terms of mo-

nopoly, than a mere producer of detail variation. Our contention is supported by the decisions of the Supreme Court in *Winans v. Densmead*, 15 Howard, 341, and *Morley Machine Co. v. Lancaster*, 129 U. S. 273.

Either infringement must be found in this case or mere mechanical change, with or without invention, will escape a charge of infringement of a prior patent. This Court has often held to the contrary, and it is safe to say has never had before it for adjudication a patent with claims in broader terms or for an invention of more basic and epoch-making character.

The art has not ignored the patentee. Until Lyndon gave the invention to the world there was no adequate governor for electro-mechanical water wheels. Lyndon diligently notified infringers from the first and he had not the means to prosecute infringers and never was in a position so to do. The complainant in this case and assignee of Lyndon has taken up the work, and either the monopoly should be respected, or a tragic day has arrived for patentees who put their faith in governmental contracts.

The trial Court fell into the misapprehension of the law that the patent must be narrowly construed when the specific structure disclosed in its drawings and specifications had not been utilized. It is true that if the specific disclosure of a narrow patent and *which claims substantially the very thing shown in the drawings, and no more*, does not take the field, but something radically at variance therewith does,

the patent will not ordinarily be as broadly construed, in weighing infringement, as if the opposite state of facts existed. *But in the case at bar, to emasculate the patent by any such process of false reasoning and false application of patent law, is to nullify the whole grant, because Lyndon made and claimed a broad and important invention.*

In this connection see the principle announced by this Honorable Court in *Kings County Raisin & Fruit Co. et al. v. United States Consolidated Seeded Raisin Co.*, 182 Fed. 59, to the effect that anticipation does not attach to a mere *abandoned experiment*, or prior theoretical machine; also the principle announced in the *Paper Bag* case, 210 U. S. 405, to the effect that the law does not require of a patentee that he ever practice the invention himself, or that the exact thing of the patent disclosure be put into practice, in order that the patent may be found infringed by another who uses a different thing within the spirit of the invention.

We repeat, that Lyndon complied with section 4888 U. S. R. S., to the effect that "in case of a machine, he shall explain the principle thereof, and the best mode in which he has contemplated applying that principle, so as to distinguish it from other inventions; and he shall particularly point out and distinctly claim the part, improvement or combination which he claims is his invention or discovery."

Referring to the said statute, Walker says (section 174):

"The description is required to explain the principle thereof, and the mode of applying

that principle that the inventor believes to be the best. It is not necessary that the description should be intelligible to every intelligible man, nor to every skilled mechanic. If it can be understood by those who possess full knowledge of the prior inventions in the same department of art or science, it is full, clear, concise and exact enough to comply with the statute."

(See *Loomis v. Higgins*, 105 U. S. 580.)

Also the rules of the Patent Office confine the applicant to but one specific disclosure.

It is always the complaint of the infringer that he has made a change from what the patentee has shown in his patent. *It is easy to multiply the species when the genus has been roughed out.* But the real inventor, and the man who must be respected and paid for his inventive act, is the man who blazes the trail by which the later practitioner in the art must travel to get the results. *Appellant contends that no one has obtained the results produced by the Lyndon invention without using that invention, as claimed.* And while we well know that a patentee does not claim "results" but means for producing results, we point to the claims of the patent in suit, and to the nature and merits of the invention, and pray that Lyndon's assignee, the appellant, be upheld as the owner of a legal and valid monopoly for the *entity* which the defendant has employed.

This entity, in combination claims, is to be considered as a single thing, distinct and separate from the parts of the claim, as has been pointed out in *Yesbera v. Hardesty*, 166 Fed. 120, 125, as follows:



“In a combination patent there are no unpatented features in the sense that they are separable from the patented ones, and no one of the elements is patented. They may all be old and not patentable at all unless there is some new combination of them. The point to be emphasized is that the law looks not at the elements or factors of an invented combination as a subject for a patent, *but only to the combination itself as a unit distinct from its parts*, and in such case there could be no comparison of patented and unpatented parts.”

## SPECIFICATION OF ERRORS AND ARGUMENT.

When we turn to the conclusions of the Court, (T. p. 62) we are immediately confronted with the clearly apparent fact that the Court, in the first place, paid too much attention to immaterial details of the specific construction disclosed in the Lyndon patent, and in the second place, erroneously applied the tests of infringement by a too curtailed application of the elastic doctrine of equivalents.

We contend that the Court was clearly in error in his understanding of the Paper Bag case, 210 U. S. 405 (*supra*), and the other cases mentioned in the conclusions (T. p. 63). Clearly, in claims such as 3, 4, 6 and 7 of the patent in suit the word “means” or the like, is employed to describe connective features of the combination and such terms may be considered to cover practically any substitute part or feature. This appears particularly from the language in *Davis Sewing Machine Co. v.*

New Departure Manufacturing Co., 217 Fed. 775, and quoted below.

In *Ries v. Barth*, referred to in the conclusions of the Court, we have almost an analogous situation, and the Court there states that the patentee in reciting "means" or the like, in his claim, calls for any means, and covers any means, for the purpose in view. Your Honors' attention is particularly invited to these four cases referred to in the conclusions of the Court and presented by appellant in the lower Court (T. p. 63). The Court admits that claims using such terms as "means" are valid where the specifications clearly disclose the particular means or mechanism having the function indicated in the claims. The trial Court apparently considered that this language implied that the claims must be limited to such *particular* means or mechanism. *What the Supreme Court meant was that claims for means are valid where they are supported by the presence in the specifications of means having the function indicated by the claims.* The Supreme Court said that "means" and "mechanism" were clearly used by the inventor to express the *relation* between the correlated parts, the plate and the cylinder in that case, and which was found to be the gist of the invention, such plate and cylinder in themselves being old. We contend in this case that the *relation* between the by-pass valve and the water gate was new with Lyndon, as also the *relations* between the features preventing over-running of the governor, and that the defendant-

appellant is using such *relation* and infringes the claims.

IN CONSIDERING A COMBINATION CLAIM WE HAVE BEFORE US AN ENTITY THE COMPONENT PARTS OF WHICH MAY INCLUDE "MEANS" FOR COMPLETING THE WORKING RELATIONS BETWEEN THE OTHER PARTS. THESE MEANS WHICH WE MAY CALL CONNECTIVE IN NATURE, MAY BE REPRESENTED IN THE INFRINGING STRUCTURE BY ANY SUBSTITUTE WHICH CAN PERFORM THE SAME OFFICE OR DUTY. SO IN SEARCHING FOR INFRINGEMENT OF A COMBINATION CLAIM WE MUST SEARCH FOR THE ENTITY, FOR THAT IS WHAT THE CLAIM COVERS. ONE CANNOT AVOID INFRINGEMENT BY USING THE COMBINATION *ENTITY* AND IN SO DOING PROVIDING ANY MERE SUBSTITUTE CONNECTIVE MEANS. THE TEST IS, HAS THE SUBSTANCE OF THE INVENTION BEEN APPROPRIATED BY THE DEFENDANT.

Each combination claim of a patent is a separate entity, and each of the claims of the Lyndon patent in suit is for a combination. There is a striking analogy between such entity and the entity of a corporation. A corporation is no less a unit or single entity because it includes a plurality of stockholders. These stockholders may in fact be other corporate entities as well as natural individuals.

The claims are the measure of the invention as within the Paper Bag case decision, and are different measures of the invention in accordance with their several scopes.

The substance of the claim is the combination. That is the entity to be considered in inquiring as to infringement. In other words, the combination is a unit and such unit is the thing to be found in the infringing structure. It is not less a unit, because it has component parts, than is the human body with its co-ordinated organs and their functions and “inversely” operated legs actuated by the connective nervous system. *Where such component parts are recited as inter-related through the agency of means, the claim is to be construed as a unit and is not to be interpreted as being merely or in any particular sense or any such means alone.* It is not proper to magnify the importance of specific means to such an extent that the substance of the unitary combination is lost sight of. Within the meaning of the Paper Bag case, which is the last word of the Supreme Court on this subject, the “pith” of the invention is the *combination as a unit* stated in the claim and the “means” recited in the claim are employed in a connective sense or as, connecting together or, joining together in inter-relation the other parts. Such means may be the same means or any substitute means capable of performing the same service or duty in the combination. In other words, coming down to Claim 6 of the Lyndon patent, it was necessary to include in the claim means for inversely operating the water gate and



the by-pass valve to complete the inter-relation of parts of the structure, thus forming the unitary combination. Had the claim merely been as follows: "Inversely operating water gate and by-pass valve"; or, on the other hand, "Means for inversely operating a water gate and a by-pass valve" and for nothing more, the "means" would then have been the entire substance of the claim. As it is, the means of such claim is merely used in a connective sense to complete the inter-relation of the parts, thus making a proper unitary combination, and the employment of any substitute for Lyndon's specific means will not avoid infringement. The principal elements of the claim are, therefore, the water gate operating means and the by-pass valve, and the "means connected to the water gate operating means and operating the by-pass valve inversely to the operation of the water gate" are any connective means perfecting the inter-relation between the water gate operating means and the by-pass valve, and completing the combination.

Thus infringement can not be avoided by using a substitute for specifically shown connective means if the *entire combination* be employed in the infringing structure; the test is whether the combination as a unit is found in the infringing structure irrespective of the presence of mere substitute connective means. To allow an infringer to escape because he provided a mere substitute connective means violates the entire principle of construction of combination claims, particularly within the meaning of the Paper Bag case and the other cited cases

interpretive of that decision, and with the addition of the very recent case of Davis Sewing Machine Co. v. New Departure Manufacturing Co., 217 Fed. 775, second syl. and last paragraph of page 782, page 783, first and second paragraphs page 784, and second paragraph page 786. In this decision the following significant language is found (p. 782):

“In other words, where used with reference to the exact point of novelty, ‘means’ or ‘mechanism’ may expose the claim to attack on the ground that it is functional; in that respect, each case will present a problem by itself. But where used with reference to the make-up of the field in which the real invention finds its usefulness or with reference to the *connecting parts* which permit the salient novelty of the invention to accomplish its function, *these words are only* a convenient formula of the broadest equivalency of which the real invention permits. Their use amounts to a statement by the inventor, that, as to this element, the claim is not confined to the form shown, *nor to any close imitation of that form, but extends as broadly as is consistent with the extent of his inventive step to all forms accomplishing that part of the ultimate, composite result,*  
\* \* \*.”

The Paper Bag case is further digested in this decision, and on page 784, reference is made to the Patent Office practice pertinent to the use of the terms “means,” “mechanism,” and the like.

*Universally where the term “means” is used in the Lyndon claims, it is used in a connective sense to complete the inter-relation of working parts of the unitary combinations. No such language is used*

where the principal novel element of the combination is referred to, such as the "valve controlling said by-pass," or "a valve for such by-pass." This language applies to leading working parts of the novel unitary combinations. "Means" is used in a connective sense.

The term "equivalent" has no fixed meaning and the decisions above quoted make it clear that one cannot escape infringement by substituting different, or even patentably different, means for those specifically shown and described in the patent in suit, where the same results are obtained, or the same; or similar results are obtained in substantially the same manner. This is the doctrine of *Winans v. Denmead*, *Howe* (*supra*).

The trial Court falls into error by assuming that the patent is only for the specific thing shown in the drawings (T. p. 66). All of the authorities point out that claims may vary in scope. Certainly Claims 3, 4, 6, 7 and 8 of the patent in suit are not to be limited to the specific things shown in the specifications and mentioned in certain specific claims; even the specific claims were entitled to a broad range of equivalents warranted by the scant state of the prior art, which nowhere discloses any of the combinations covered by the patent in suit. The patent stands absolutely unanticipated: not even the attempted piece-meal anticipation condemned by the Court in *Yesbera v. Hardesty*, 166 Fed. 120, 125 (*supra*), is of avail to appellee in this case.

The Court states (T. p. 66), that we must consider the prior art in determining the proper posi-

tion to be occupied by the invention and the relation thereto of the alleged infringing device. How could the Court fail to find infringement, as far as anything in his conclusions or in the record appears, under such procedure?

The trial Court in his conclusions states (T. p. 67) that there has never been a machine manufactured like that described in the patent in suit. While it is true that not the exact form shown in the drawings has been put into practice, the invention has been widely copied, as shown by the evidence of many witnesses such as that of Prof. Cory, Dean of the College of Mechanics of the University of California (T. p. 262-498-531). Prof. Cory testified that the Lyndon invention has revolutionized the art of water wheel governing (T. p. 468-469), (Henry, T. p. 416-417). The appellee has used it, not only in this plant but in other much larger plants installed by the Pelton Water Wheel Company for the City of Los Angeles, and which company has, as we have seen, taken a license under the patent in suit and paid a large cash consideration to the appellant therefor. (Henry, T. p. 2480-2484-2486-2504.)

*The law is the only remedy* known to Comp. to establish validity and thereby establish a licensable patent. It introduces a hiatus into the affairs of patentees for the Court to rely on an absence of licenses to defeat validity—for the infringer constantly relies upon the absence of a decision of validity to refuse to pay for a license. This leaves



the patentee in midstream denied a landing on either shore.

We contend that utility of the invention is strongly established by the said licenses and by intervenor's sworn statement that it had furnished about \$194,000 worth of such apparatus. (T. p. 24-25.)

It is of no significance that this license was taken and other licenses issued only since the commencement of this suit. The fact that the Pelton Water Wheel Company intervened in this suit and was made a defendant and commenced a vigorous campaign of defense, (T. p. 21 to 50) and then took a license, acknowledged validity and withdrew as intervenor is highly significant. (T. p. 87.) There could be no better indication of what that large manufacturing concern thought of the patent in suit.

We have seen that in accordance with the Paper Bag case (*supra*) it is immaterial whether the specific device of the drawing of the patent in suit has been manufactured or not prior to the commencement of the suit.

The Court makes a most remarkable statement further down on page 67 of the transcript, namely, that unquestionably the evidence shows that the Lyndon invention will not work if the mercury cups were used as disclosed by the patent, without change.

We are unable to find the evidence to support any such conclusion and Lyndon showed more than one form and did not limit himself to mercury con-

tacts. This concerns a mere trivial detail. It was within the ordinary skill and knowledge of any electrical worker to vary the depth or substitute other form of contacts or by well known adjustments to vary the time of performance of the various parts of the structure.

See

Defendant's Expert Berry, T. p. 1007, 1008-1339;

Defendant's Expert Durand, T. p. 2865, R. D. Q. 209.

However, the machine of the patent is clearly operative.

Defendant's Expert Berry (T. p. 1323) says the *only reason* he would not guarantee operativeness is that it is not customary for engineers to make such a guarantee. (Also T. p. 1456; also T. p. 1320, Q. 898, Defendant's Expert Durand in answering XQ. 109, T. p. 2829, says:

“\* \* \* the latter (the device contemplated in the Lyndon specification) is operative \* \* \* (and said devices) are operated entirely independently of such human intervention.”

Comp's Expert Cory, T. p. 468, 469, 2385, finds in the Lyndon disclosure “a complete operating mechanism \* \* \*.”

Berry finds the electrical features simple, and he fully understood them (T. p. 901).

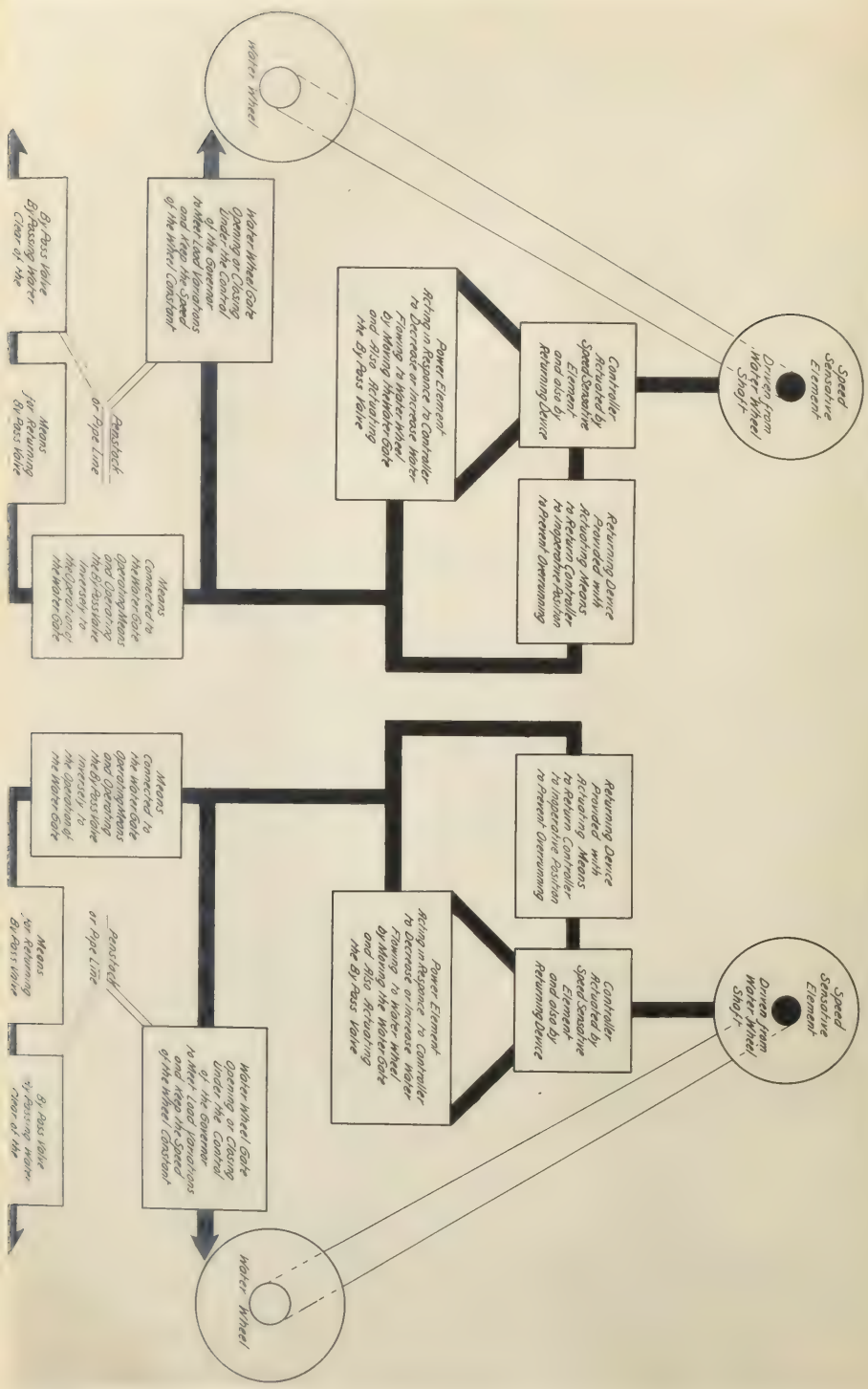
The conclusions of the Lower Court (T. p. 67—bottom) that difference in principle exists is utterly without foundation in view of the record.



# Principle of Operation

## Lyndon Invention

## Infringing Structure





A graphic showing of the principles of operation is inserted opposite to aid to a clear mental picture, and the following testimony is cited:

Electrical and mechanical actions are equivalent and electrical devices effect mechanical action. (Comp. Expert Cory, T. p. 248, Ans. 48; also T. p. 497, 2335 to 2345.)

The gate and by-pass pass movements are by mechanical means in Lyndon (Defendant's Expert Berry, T. p. 899). Mechanical action of all parts in the Lyndon patent is shown by Berry, T. p. 1310, Ans. 867.

See also Lyndon (the patentee), T. p. 1871 and Meyer, T. p. 2662.

The Bakersfield device referred to in the conclusions of the lower Court was an abandoned experiment, as we shall see, and was thrown out and superseded by something else, and never operated in accordance with the principles of the patent in suit. It did not even contain, by the remotest stretch of the mechanical imagination, all of the elements of Claims 3, 4, 7 and 8 or any near approach thereto. And it did not contain operatively the elements of Claim 6. It is now controlled from a distant plant by the Lyndon invention.

The only witness produced who had ever operated or attempted to operate this plant in regular service was the superintendent, Dearth, in charge of same from a period of a year before the installation and until many years after. Dearth was produced by the complainant, and his testimony shows that the

attempted governor devices were inoperative. T. p. 1647-1650.

That they failed to meet the requirements. T. p. 1666-7110.

That they were experimental only. T. p. 1646-1659-1679-1706.

That the said governor devices were abandoned. T. p. 1645-1648-1677-1684.

That the parts were thrown into the scrap heap and sold for junk. T. p. 1648-1650, 1653, 1654.

That after said abandoned experiments the plant was operated by hand control at great expense and inferior service. T. p. 1661-2-3-4, 1681, 1667-1682-1697.

That within the last few years only it has been "tied in" with the other plants and the system governed by a master plant located far away and known as the Crane Valley Plant. T. p. 1683-1708.

Dearth's qualifications and his testimony stands uncontradicted and is supported by Beal (his superior). T. p. 1729 to 1735, 1737-1749; also by Sessions, now practicing law and at that time president of the company who built the apparatus. T. p. 1714-1715-1716-1719-1720; by Expert Cory, 2317; also by Henry, T. p. 1798-1800-1801-1807-2260.

That the electric transmission system into which this old Bakersfield plant feeds is governed by the distant Crane Valley plant employing governor apparatus now licensed to the Pelton Water Wheel Co. under the patent in suit, is shown by the testimony of Complainant's Witness Van Orden, T. p. 1752-1760; Halloran, T. p. 1790-1792; Henry, T. p.

1796-1797, and Comp. Ex. Pelton Co.'s License agreement.

It may be true that Cobb and Van Emon and Berry tried to build a water wheel governor—they fully realized the need—the demand was very great. (Def. Expert Cobb, T. p. 554-600-731-675; Comp.'s Expert Cory, T. p. 250, Ans. 55; also by Dearth, T. p. 1654-1681-1682-1689.)

It is shown, however, that to take care of the inertia effects the well known air chamber was used and therefore they missed entirely the conception of preventing the inertia effects as invented by Lyndon.

Defendant's Expert Cobb, T. p. 764-705-767, reported that the by-pass was a failure and should be replaced by operative mechanism. T. p. 2324; Def. Exhibit Cobb efficiency report, page 18; Cobb, T. p. 756. "Whatever I stated in that report was absolutely true at the time it was written."

We contend the attempted use of the by-pass at Bakersfield was for an entirely different purpose, namely, to pass water to the riparian owners on the Kern River below the plant, and that the builders had no conception of the Lyndon invention.

See Defendant's Expert Berry, T. p. 1021-1066-1397;

Complainant's Expert Cory, T. p. 263, Q. 113.

There was no speed sensitive element at Bakersfield, and this is an essential to the Lyndon invention. Comp. Expert Cory, T. p. 2382-2309-2313-2412-2419.

Berry is the last one who had possession of the

drawings of the device, but he did not produce them. (T. p. 1228, Sessions 1722) and does not vouch for the correctness of his reproduction from memory. Def. Ex. Berry blue print No. 1; Berry, T. p. 1329. The other Def. exhibits MZ, ZZ and XX are not relied on. T. p. 748.

The Bakersfield by-pass valve was generically defective for governing purposes, in that its operation involved heavy friction, as distinguished from the Lyndon and defendant's valves, which are of the frictionless generic type, operable sensitively by the governor elements. Lyndon taught the use of the frictionless type for by-pass control.

See Cobb, T. p. 761-790-883; Henry, T. p. 1811 to 1814, 2252; Cory, T. p. 2299, 2302, 2303, 2308, 467;

Dearth, T. p. 1670-1657; Lyndon, T. p. 2026-2113-1965-1966-1967;

Van Orden, T. p. 1766 to 1770; Wilson, T. p. 2274-2275; Meyer, T. p. 2669.

We have previously disposed of the lower Court's erroneous position and view with respect to the so-called doctrine of "paper patents," which does not apply to the valid patent sued under, but only to attempted anticipations of such valid patent.

We find a peculiar statement of the trial Court, commencing at the bottom of T. p. 69, and referring to the Lombard governor elements of the defendant's structure. We must take direct issue with the trial Court; in that the issue of this Lombard



patent amounts to any declaration by the Patent Office that there is any want of equivalence between the Lyndon invention and that of this Lombard patent. It is no evidence of non-equivalence but merely a declaration of patentable difference which exists, in that the *Lombard later patent is a specific structure falling within the Lyndon broad claims*. Had Lombard demanded broad claims (which he did not) he would have interfered with Lyndon and *not otherwise*. Lombard's application was long after Lyndon, and probably after Lyndon's disclosure to Lombard. This Court has often found that a later patent may infringe an earlier patent, as in *Bliss v. Spangler*, 217 Fed. , and in *Stebler v. Riverside Heights, et al.*, 205 Fed. 735 (*supra*). The fact that the Patent Office failed to declare an interference, as it should have, between claims of the patent in suit and said Lombard patent, does not signify anything, as clearly appears in the controversy in this court and in the Patent Office, as disclosed in 227 Fed. 607, *Wilson et al. v. Bole, et al.*

It was not necessary for Lyndon or his assign to notify the Lombard Company. However, Lyndon says he did this more than once. Lyndon, T. p. 1974, 1992, 1994, and the publication of the patent is notification to the public. Lyndon never knew of the infringement of his patent by the defendant in this case. T. p. 2005.

The record shows fully that this device has been part of water wheel governors as to which notification had been given. T. p. 293, 2135. We shall see later on that this Lombard speed returning element

of the infringing structures was clearly the invention of Lyndon and embodied in the disclosure and claims of the Lyndon patent.

The trial Court then proceeds to make the remarkable assertion that Claims 8 and 9 are the only claims of the patent in suit concerning the by-pass valve. T. p. 70. *How could the Court overlook the clear inclusion of this valve in Claims 6 and 7?* Certainly the trial Court has not fully weighed and considered these claims or such oversight could not occur. *We believe that therein lies possibly the most fundamental error in the attitude of the trial Court to this whole question of infringement, namely, that the Court has not considered and given the proper legal effect and weight to the broad claims of the patent in suit, but has merely compared the drawings of the patent in suit, with defendant's structures, and hesitated to find them strictly and technically and in all details and respects, mechanical equivalents.* In such attitude he ignored the substance and gist of the invention.

The testimony shows that the defendant clearly uses the same generic type of valve for its by-pass. Wilson, T. p. 1628-1629; Van Orden, 1766 to 1770; Cory, 2308; Lyndon, 1965 to 1967-2113.

This generic frictionless type of valve, as exemplified by the "butterfly" valve, is clearly disclosed in the patent in suit, and it may well be read into Claims 6, 7 and 8 if the Court so elects. As to this, see the opinion of the Court in the recent decision of Waterloo Cement Machinery Corp. v. Engel, 230 Fed. 169, at page 170, as follows:

(1) "According to the specification the supporting crossbar is provided with an upwardly projecting spindle so affixed as to make it a part of the crossbar. Neither of the claims in issue particularizes such feature, and the first question to be answered is whether the particular crossbar of the specification is included in the claims and protected by the patent. It is referred to in the specification with considerable detail, and stress is laid upon the manner of arranging the shaft in relation to the mixing tank and extending it into 'an integral upwardly extending sleeve 13 of the tank so as to provide an axle bearing for the tank, preventing the latter from swerving or tilting on its ball bearings.' The drawings quite clearly illustrate the details of construction of the crossbar, and, indeed, the feature of projecting the shaft into the tank was evidently regarded by the patentee as a highly important feature of the invention. To project the bearing into the tank, instead of projecting it outwardly from the bottom of the tank, as shown in prior patents in evidence, was conducive to a more even distribution of the load and a better balancing of it on the bearing shaft, and also to a more convenient use of the tank for mixing and discharging material. In my opinion the claims must be construed to cover the actual invention; that is, as if the claims had specified the crossbar or spindle as one projecting into the tank. Such a construction I believe is justified, even though the claims do not contain the words 'substantially as described.' *Mitchell v. Tilghman*, 19 Wall. 287, 22 L. Ed. 125."

The Court clearly misjudges the invention of Lyndon in his conclusions (T. p. 71). No governor was ever heard of that had as its object the speeding up or slowing down of a water wheel. The

object of the governor is to maintain constant the speed of the electro-mechanical water wheel. The object of the defendant's device is not to take the pressure off the wheel and make it tend to slow down, but equally with the Lyndon invention, *to keep the wheel moving at a constant speed and thereby keep the potential of electrical energy in the circuit of the generator constant*. It is immaterial if the defendant's device only uses the by-pass in a closing movement of the water wheel gate, or needle valve, *which we deny*. Lyndon discloses means for causing this movement in *either* closing or opening movement of the water wheel gate. The claims are clear as to this, and the whole purport of the Lyndon patent is to that effect.

*Defendant's witness* McAfee, who has operated the Division Creek plant for years and is familiar with the Cottonwood plant also, gave very definite testimony, T. p. 1545, Ans. 34; 1548, Ans. 47; 1549, Ans. 50; also 1555 to 1572, and which is very convincing on this.

The continued use by the defendant is shown by this same witness. T. p. 1581-1582-1583, and that its use was to prevent pressure variations and secure accurate governing. T. p. 1591, Ans. 292, 1552. On this question of governor movement see also, Cory, T. p. 429; Lyndon, 1858; Henry, 407. That both plants have the same devices, see Scattergood, 162.

A few of the questions and answers of Prof. Cory and Witness Scattergood and Defendant's Witness McAfee are quoted as follows:



*Prof. Cory testifies.* T. p. 279, referring to Comp. Ex. U and V.

“Q. 160. If the circulation of oil or other fluid in these dashpots is retarded, what will be the effect upon the responsiveness of the by-pass valve to the governing action?”

“A. The tendency will be to make the governing of the by-pass valve more slow or tend to retard its operation, although not at all to prevent its ultimate operation to the limits desired. It introduces what is known as the time element or delay in time in the operation of the by-pass valve. If the flow of the oil or liquid in the dashpot is retarded by the adjustment of the screws, it would tend to increase the time element required for the operation of the by-pass valve or to make it operate more slowly.”

*Scattergood testifies.* T. p. 162, in regard to the defendant's apparatus:

“Q. 26. By Mr. Blakeslee: What is the result of this operation of the auxiliary needle in conjunction with the sudden closing of the main needle?”

“A. The result is to prevent dangerous rise of pressure which might endanger the penstock line or, at least, that is the intended result.”

T. p. 166—

“Q. 32. If this auxiliary needle and nozzle were eliminated, would or would not there be a difference in velocity of water flow past the main needle upon moving the same toward closing position, resulting in a difference of velocity of the water wheel in rotation during governing action?”

“A. There would be and there is at all times, as I have already stated. The effect of the auxiliary device occurs simply in rare instances in which the closure is unusually rapid, and to prevent that increase going beyond a certain point—that is, the increase of pressure in the pipe line—and to that extent it affects the possible increase which might otherwise appear in the velocity of the water corresponding to the additional increase of pressure which would under those circumstances occur.

“Q. 33. Then am I correct in deducing that the extent of service of the auxiliary needle and nozzle are dependent upon the extent of operation of the governing device, which is, in turn, controlled by the extent of fluctuation of load upon the water wheel?

“A. Altogether upon the rate of that fluctuation. At ordinary rates of fluctuation of load, the auxiliary nozzle has no effect whatever, and it is only in case of sudden decreases in load that its effect occurs, and the effect in preventing increases of pressure in the pipe line increases of velocity of the ejected water from the main nozzle is only partial.

“Q. 35. Do you remember when both of these plants with the governing devices were installed?

“A. I believe they were both installed in the year 1909, one in the early part of the year and one in the fall.”

T. p. 1544. McAfee testifying says:

“Q. 33. By Mr. Westall: State what, if any,

means are provided in the Division Creek No. 2 plant to guard against excessive pressures in the pipe-line.

“A. That is by the relief nozzle or auxiliary.

“Q. 34. Please state in a general way the construction and mode of operation of the auxiliary relief nozzle referred to in your last answer, and describe how it operates to protect the pipe-line from excessive pressure.

“A. The auxiliary or relief nozzle is supposed to be a relief, and which is a relief to the pipe-line in surging or sudden loads—overloads—of any kind that may come on and cause the big needle to open suddenly. The relief nozzle is supposed to take care of that in the opening or closing suddenly of the main needle.

“Q. 36. By Mr. Westall: State in a general way the movements of the main needle nozzle and the auxiliary relief nozzle during ordinary operating conditions of Division No. 2 plant.

“A. Under the ordinary conditions of operation now the auxiliary is always closed.

“Mr. Blakeslee: We object to the answer and ask that it be stricken out as not responsive to the question.

“A. The auxiliary is always closed, as I have said, unless there is a load comes on of some kind—a heavy load—of 80 or 100 kilowatts, the auxiliary doesn't move. The way the constant load is now the auxiliary is always closed, as I have stated.

“Q. 37. Have you at any time observed especially or kept any record of the number of

times during any fixed period that the auxiliary relief nozzle opened?

“Yes, sir.

“Q. 38. When did you make those observations and how long did you continue to note those matters especially?

“A. I have been watching it for movements since about the 15th of this month, and the auxiliary relief never opened till I forced a heavy surge on the pipe-line to make it open to see if it was working properly.

“Q. 39. Please state if you know approximately how often during the same period of time the main needle moved toward either open or closed position?

“A. It is continuous at the time I am running. It is always opening and closing to adjust the speed.

“Q. 40. How is the period during which you have given especial attention to the movements of this auxiliary relief nozzle compared as to normal operation of the plant with other periods during which you gave no especial attention to the movements of that auxiliary relief nozzle?

“Mr. Blakeslee: Objected to as indefinite, no object of comparison or basis of comparison being given.

“A. Well, during the time that we had the dipper dredge working it caused a heavy fluctuation in the load, and they would work constantly then,—both the relief or auxiliary and main needle.

“Q. 41. By Mr. Westall: But during the



time that you did not have this dipper dredge in operation how did the auxiliary needle-valve operate as to opening under changes of load?

"A. If we had other loads, which we did have, which was steady, the auxiliary stayed closed until some sudden surge of load would drop off causing the speed to run up and the main needle would naturally close and the auxiliary would open to give the relief water the water-hammer in the pipe-line.

"A. 43. I was officially in charge like I am now of the plant until August 15, 1913.

"Q. 44. What was your connection with the plant prior to that time and during the four years that you have mentioned?

"A. Much the same as I am now. I was operator, only we were running more shifts.

"A. 47. Well, there was for three years of the time that that auxiliary or relief and the main needle were operating continuously, due to heavy fluctuations in the load. But since August 15th of last year the load has been practically steady and the auxiliary has had no chance very much, only to remain closed.

"Q. 50. State whether or not during ordinary operation of the plant when the needle of the auxiliary nozzle is in its ordinary closed position, as you have testified to, water escapes constantly or at all through the auxiliary relief nozzle.

"A. It does.

"Q. 74. By Mr. Westall: I would call your attention to Complainant's Exhibit V and ask if you understand the construction, uses and

purposes of the device such as therein attempted to be illustrated, and, if so, to state briefly what you conceive to be represented by the exhibit referred to.

“A. The part marked ‘Water Gate Stem, M. M.’ is the main needle and nozzle. The part marked ‘By-pass Valve Stem’ is the auxiliary nozzle and needle.”

*And under cross-examination Witness McAfee testifies.*

“Q. 93. All of these photographs represent from varying view-points and in different details parts of Division Creek No. 2 power plant on the line of the aqueduct of Los Angeles, California, such power plant being situated in Inyo County near the town or city of Independence? Is that not correct?

“Mr. Westall: The same objection.

“A. Yes, sir. It is 12 miles from that town. That is our post-office.

“Q. 112. Then this governor apparatus is operated to act upon the water-wheel needle and the by-pass needle so as to change their position, then their positions are changed due to the changes in speed of rotation of the water-wheel shaft? Is that not correct?

“A. Yes, sir.

“Q. Now, excepting when the auxiliary needle is returning independently to a certain position, that is, independently of the water-gate needle, this auxiliary needle moves inversely to the water-gate needle, does it not? That is, in a direction opposite of that in which the water-gate needle is moving?

“A. It does that in case the main needle closes. The other one will move in reverse. That is, it will open.

“Q. 116. I mean at these times the movement is in the opposite direction. If one is closing the other is opening?

“A. Yes, sir.

“Q. 117. And the water-gate needle—and I use this term as distinguished from the main water-gate that you have testified about—which I take it naturally shuts off the water and is shown in the upper central portion of Complainant’s Exhibit H,—is mechanically connected with your auxiliary needle so as to cause this inverse movement of the two needles. Is that not correct?

“A. Yes, sir.

“Q. 121. There is also a means provided at this plant whereby the water-wheel needle and the auxiliary needle may be jointly or at the same time or inversely and oppositely moved by hand?

“A. Yes, sir.

“Q. 122. And that is the part marked ‘Hand Operating Lever’ in Complainant’s Exhibits J and K, is it not?

“A. It is marked ‘Hand Operating Lever.’

Q. 123. This may be used to work the two needles, namely, the water-wheel needle and the auxiliary needle, simultaneously or at the same time, and inversely or oppositely through the rock-shaft or the like which swings on connecting rod II in Complainant’s Exhibit HH?

“A. Yes, sir.

“Q. 124. And it is through that same connecting rod II that the two needles are operated by the features under control of the speed sensitive fly-balls. Is that not correct?

“A. Yes, sir; where it is not the hand control. I thought you were dealing with the hand control.

“Q. 125. I was, and now I am asking if the same motions are not imparted to oppositely move the main and auxiliary needles referred to through the same connecting rod when the governor is acting under control of the fly-balls. Is that not correct?

“A. Yes, sir.

“Q. 128. But when they move in a closing direction the auxiliary needle will be moved in an opening direction, will it not?

“A. Yes, sir.

“Q. 129. And if then the motion of the main needle be reversed and the main needle be worked in an opening direction, the auxiliary needle will be moved in a closing direction, will it not?

“A. Yes, sir.”

Clearly the defendant's device contains the slow return to normal position, and this normal position may be adjusted to suit the requirements of any individual plant.

Complainant's Expert Cory, T. p. 521 to 526,  
466, 279, 2319, 485;

Defendant's Expert Cobb, 713, Ans. 255.



The defendant's device wastes water to prevent inertia effect, *during governing* and if so adjusted, saves it, *after* the governing period and "time element" has been introduced, by slow return of the by-pass valve. The Lyndon device wastes water to prevent inertia effect, *during governing* and if so adjusted saves it *after* the governing period "time element" has been introduced, by slow return of the by-pass valve (Comp. Ex. A, patent in suit, specifications, p. 4, lines 80 to 98); that is, the velocity of the water in the pipe has been changed to suit the new load after the elapse of the "time element being taken care of in the by-pass;" and there will be flowing from the pipe just the necessary water to carry the load. This is of the essence of the Lyndon invention and *is water economy*. If the velocity of the water from the source of supply (the pipe) is varied to suit the load, the quantity is varied in the same proportion, as it is elementary that the quantity is proportional to the velocity multiplied by the cross section of the supply pipe; and as the cross section of the supply pipe is constant, the quantity will vary directly as the velocity. Hence Lyndon attains the maximum water economy consistent with quick governing and prevention of dangerous or damaging inertia effects. If defendant's by-pass does not discharge water, at least *during governing* then why use a by-pass under the governor control at all? McAfee says it did at all times *during governing*.

Bearing in mind the fact that it is perfectly proper, although not necessary, to read the friction-

less by-pass valve of the Lyndon patent into Claims 6, 7 and 8 thereof, the trial Court admits, at the bottom of pages 71 and 72 R. that there is proper ground for finding infringement in this case. We believe that the trial Court in his very conclusions has laid a proper and strong foundation for the reversal of the decree in this case and of finding infringement as well as validity.

Further, on page 72 T., the trial Court admits the propriety of extensive application of the doctrine of equivalents and when your Honors have found the Lyndon claims readable on the alleged infringing devices you can clearly adopt the said views in favor of complainant, and find infringement in this case.

The assignments of error on this appeal, appearing at T. p. 52, are respectfully called to your Honor's careful consideration in addition to the foregoing observations and the findings and conclusions of the trial Court.

The Court finds nothing against the validity of any of the claims of the patent and has paved the way for a finding of infringement even under an unnecessarily forced application of the doctrine of equivalents.

We submit that a reversal of the decree will be found to be wholly justified upon the record.

## LYNDON'S INVENTION AND THE ALLEGED PRIOR ART.

In bearing upon the breadth and import of the invention of the patent in suit, we wish to quote here Claims 3, 4, 6, 7 and 8 thereof:

*“3. In a water-wheel governor, the combination with a water-gate-operating shaft, and means for operating same in either direction to govern the water-wheel, of a controller for said operating means, responsive to changes of speed of the water-wheel, a returning device for said controller provided with a clutch connection to said operating-shaft, and means, actuated by said controller on movement thereof from normal position to engage said clutch with the said shaft, so as to cause the return of the controller to normal position and interrupt the governing action before it has overrun the proper amount, substantially as and for the purpose set forth.*

*“4. In a water-wheel governor, the combination with a water-gate-operating shaft, a driving-shaft and reversing clutch-gear, adapted to turn the water-gate-operating shaft in either direction, a controller, responsive to changes of speed of the water-wheel and controlling such reversing-gear, and a returning device for said controller provided with actuating means controlled by said controlling means to return the controller to inoperative position, so as to prevent excessive movement of the governor.*

*“6. In a water-wheel governor, the combination with means for operating the water-gate in either direction, a by-pass for the water-wheel, and a valve controlling said by-pass, of means connected to the water-gate-operating*

*means and operating the by-pass valve inversely to the operation of the water-gate.*

*“7. In a water-wheel governor the combination with means for operating the water-gate in either direction from normal position, a by-pass for the water-wheel, and a valve for such by-pass, of means connected to the water-gate-operating means and adapted to operate the by-pass valve from normal position in either direction, so as to control such valve inversely to the control of the water-gate, during the governing action of the water-gate, and means for returning the by-pass valve to normal position on completion of governing movement of the water-gate-operating means.*

*“8. In a water-wheel governor, the combination with a shaft for operating the water-gate in either direction from normal position, a by-pass for the water-wheel and a valve for such by-pass normally held in partly-open position, of an operating device for said valve provided with means for returning the valve to normal position, a clutch, adapted to connect said operating device for the by-pass valve with the water-gate-operating shaft to control the by-pass valve inversely to the water gate, reversing means for operating the water-gate-operating shaft in either direction, a controller, responsive to the speed of the water-wheel and controlling said reversing means, and means operated by said controller to bring the aforesaid clutch into operation and to release said clutch when the governing action is effected.”*

These claims stand upon the face of the record as absolutely unanticipated. The Swiss and French alleged patents, neither of which shows a positively, inversely coupled water gate and by-pass valve with



## TABLE OF DATES

LAMAR LYNDON	BAKERSFIELD	NEWTON LAMB	C. S. ENGLISH	EARL P. WET-MORE	IRENE SCHAAD Swiss	ESCHER-WYSS French	N. LOMBARD	N. LOMBARD
The inventor and patentee of patent in suit.	Alleged public use.  Cobb report August, 1896. Cobb efficiency report, Aug., 1897. Apparatus shown inoperative and abandoned immediately thereafter.	This has been set up by defendant as a prior publication.	U. S. Patent alleged to anticipate.  Application, Dec. 23, 1893. Patent issued June 5, 1894. No. 521,085.	U. S. Patentee, alleged prior inventor.  Application Jan. 16, 1894. Patent issued May 8, 1894. No. 519,597.	Foreign Patent alleged to anticipate.	Foreign Patent alleged to anticipate.	U. S. Patentee, alleged prior inventor.  No. 533,656. Filed Aug. 4, 1894. Issued July 5, 1895.	U. S. Patent set up by Complainant in rebuttal to prove the adoption by Lombard of the Lyndon invention as applied to Lombard's earlier patented device.
Lyndon's return to U. S. from Japan May 28, 1898.  Disclosure to others between May 28, 1898, and early summer of 1898 by sketches and verbal.  Lyndon's drawings Nov. and Dec., 1898.  Efforts to interest purchasers, 1898.		<b><u>LYNDON ENTERS FIELD AS INVENTOR</u></b>						
Instructions to Marcellus Bailey, patent attorney, to file July 28, 1899.  Lyndon filed Caveat, Oct. 13, 1899.	Further experimental work on by-pass on Knight wheels probable date early in 1899.  By-pass and dynamo-meter finally and definitely abandoned.	<b><u>LYNDON APPLIES TO COMMISSIONER OF PATENTS FOR PROTECTION BY CAVEAT.</u></b>			Swiss, No. 17,536, received in U. S. Patent Office Sept. 2, 1899.			
Lyndon took to Knight Bros., patent attorneys, and instructed to file application for patent July 7, 1900.  Papers of application complete Sept. 8, 1900.  Application filed in Patent Office Sept. 13, 1900.  Patent issued Mar. 11, 1902. No. 695,220.  Lyndon was thereafter as before, diligent in efforts to introduce his invention to public use.		<b><u>LYNDON APPLIES TO COMMISSIONER OF PATENTS FOR PROTECTION BY U. S. LETTERS PATENT.</u></b>				French No. 291,588, received in U. S. Patent Office June 21, 1902.		
		Patent published, Feb. 26, 1901.			<b><u>U. S. LETTERS PATENT ISSUED TO LYNDON.</u></b>			Application Dec. 12, 1901. Issued Mar. 18, 1902.
SEE TRANSCRIPT OF RECORD PAGES:		Cobb, 718. Berry, 1141. Cory, 2291, 2293, 2331, 2323.	Cory, 2289, 2293.	Cory, 2290, 2293.	See objections on Record 541, 546, 597 and 891. Cory, 2294, 2350; Berry, 1356.		Cory, 2290, 2293. Berry, 1099, 1409, 1504, 1506. Ensign, 1494.	Henry, 2209-10-11. Ensign, 1501, 1503, 1504, 1506. Van Orden, 1757, 1771.

LAMAR LYNDON	BAKERSFIELD	N	SS	N. LOMBARD
The inventor and patentee of patent in suit.	Alleged public use.	Alleged public use.	U. S. Patentee, alleged prior inventor.	
	Cobb report August, 1896.		No. 533,656. Filed Aug. 4, 1894. Issued July 5, 1895.	
	Cobb efficiency report, Aug., 1897.			
	Apparatus shown inoperative and abandoned immediately thereafter.			
Lyndon's return to U. S. from Japan May 28, 1898.				
Disclosure to others between May 28, 1898, and early summer of 1898 by sketches and verbal.				
Lyndon's drawings Nov. and Dec., 1898.				
Efforts to interest purchasers, 1898.				
Instructions to Marcellus Bailey, patent attorney, to file July 28, 1899.	Further experimental work on by-pass on Knight wheels probable date early in 1899.			
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	By-pass and dynamo-meter finally and definitely abandoned.			
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Application filed in Patent Office Sept. 13, 1900.				
Patent issued Mar. 11, 1902. No. 695,220.		F		
Lyndon was thereafter as before, diligent in efforts to introduce his invention to public use.			UED TO	

SEE TRANSCRIPT OF RECORD  
PAGES:

23

546, Cory, 2290, 2293.  
Berry, 1099, 1409. 1  
Ensign, 1494. 1

means for inversely operating the same, or any positive means for slowly returning the by-pass valve to normal position, or any means for positively preventing the governor from "over-running," were excluded from evidence by the Honorable trial Judge, inasmuch as only purported certified copies were introduced, the alleged certification not being as required by statute. The certification purports to be merely that of certain officials in the foreign countries, and such official certifications have no standing in the Courts of this country, any more than mere unlegalized personal affidavits, the trial Court therefore refused to consider them. *However, the record in this case clearly shows the invention and disclosure by Lyndon, the patentee, prior to the date of publication of either of these Swiss and French patents.*

The record also shows that Lyndon disclosed his invention fully in the spring of 1898 to Meyer and immediately thereafter to a very large number of others. Very full corroboration of his early invention is recited by the various witnesses, who almost without exception are men in high standing.

On the subject of disclosure, attention is invited to the following testimony, Lyndon, T. p. 1859-1833.

Lyndon disclosed to Meyer, T. p. 1822, 1831, 2017, 2018, 2022, 2026, 1833.

Lyndon disclosed to Merrill, T. p. 1834, 1841.

Lyndon disclosed to Reid, T. p. 1834, 1838, 1839, 2019.

Lyndon disclosed to Bailey, T. p. 1892, 1905, 2040.

Lyndon disclosed to York Mfg. Co., T. p. 1845-7, 1903.

Lyndon disclosed to Knight, T. p. 1892, 1905, 2044.

The depositions of all the above witnesses were taken in the East and they all corroborate the statements of Lyndon. See especially that of Thorburn Reid, T. p. 2688, 2696 and 2697; Meyer, T. p. 2657, 2665; Edw. Lyndon, T. p. 2720, 2723, 2728.

The accompanying table of dates and the above testimony will show that neither the French or Swiss alleged patents could possibly invalidate that of Lyndon, even if they had been accepted as evidence before the lower Court.

This testimony clearly follows the teaching of *Yesbera v. Hardesty*, 166 Fed. (supra), and *Topliff v. Topliff*, 145 U. S., that fragmentary piecemeal anticipation is of no avail. Not a single example or specimen of the combinations of the Lyndon patent is found in the prior art.

It is not necessary to further call this Court's attention to the abandoned and discarded experiments, and their non-anticipatory nature. The case of *Stebler v. Parker*, 177 Fed. decided by your Honors, and many others, are in point. It is settled law that a mere abandoned experiment, and particularly where the result aimed at in such experiment is filled by the very invention of the patent in suit, cannot anticipate such patent.

The testimony disposes of: the alleged anticipating Lamb patent, *pleaded as a prior publication, but not prior to the date of the patent in suit*; the patent to English; the patent to Wetmore; and the



# GRAPHIC SHOWING OF LYNDON'S DILIGENCE.

Lyndon conceives his invention  
endeavors to others and endeavors to  
interest Eng. of McIntosh-Seymour Co.  
without success.  
Endeavors to interest American Impulse

Water Wheel Co., without success.

Endeavors to interest York Mfg. Co.  
without success.

Contract through York Mfg. Co. & Marcellus  
Bailey

Instructed Knight Bros. to apply for pat.  
Application for patent filed

Pat. issued to Lamar Lyndon \$695,220

Endeavored to sell to or secure roy-  
alty from numerous blads. of water  
wheel & gows. & users without suc-  
cess even after notice of infring-  
ment— among these were:

Allis Chalmers Co.	) was never
Felton Water Wheel Co.	(financially
	able to
Great Northern Pw. Co.	) prosecute
	(a suit a-
Leonard Governor Co.	) gainst any
	(infringer
L.P. Morris Co.	
Woodward Governor Co.	
Ludlow Valve Co.	

Finally entered into negotiations  
with and sold to Henry Complainant in  
this case.

before June 15th, 1898

during summer of 1898

summer, autumn and winter 1898

spring of 1899

summer of 1899

autumn of 1899

winter of 1899

July 8th, 1900

Sept. 13th, 1900

file  
wrap-  
per  
of  
pat-  
ent  
in  
suit

Lyndon testifies and con-  
firming witnesses  
LAW. LYNDON

KIRKILL

REED

SHIPLEY

" "

" BAILEY

"

KNIGHT

KNIGHT

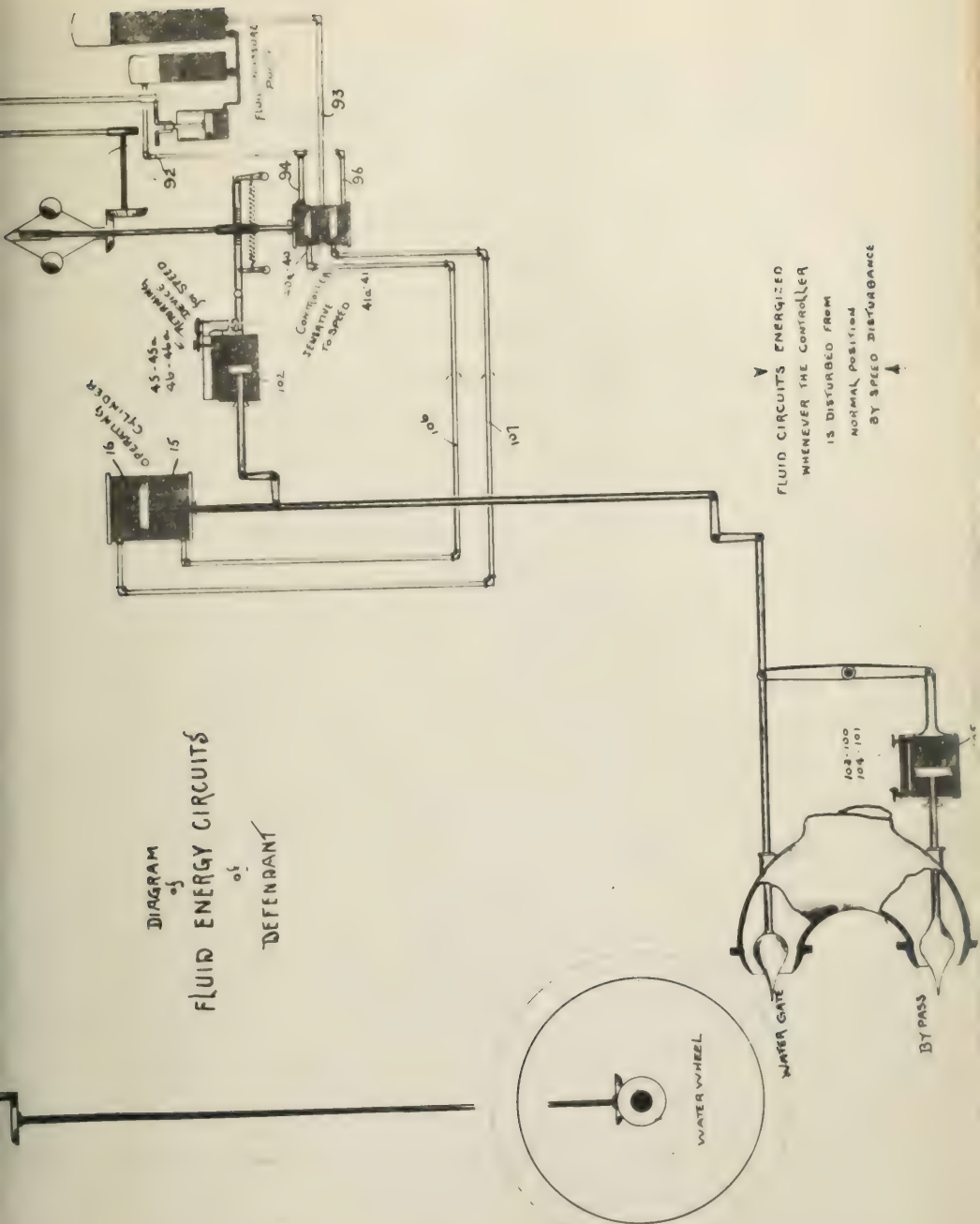
March 11, 1902

Lyndon's Invention  
U.S. LETTERS PATENT  
695,220

# GRAPHIC SHOWING OF LYNDON'S DILIGENCE.



# DIAGRAM of FLUID ENERGY CIRCUITS of DEFENDANT



FLUID CIRCUITS ENERGIZED  
 WHENEVER THE CONTROLLER  
 IS DISTURBED FROM  
 NORMAL POSITION  
 BY SPEED DISTURBANCE





earlier patents to Lombard, as well as the abandoned experiment of the so-called Bakersfield device.

### THE LYNDON PATENT AND INFRINGEMENT THEREOF.

All of the working elements of the Lyndon invention are mechanical parts, operating by mechanical means, in mechanical movement.

In the specific form illustrating the invention Lyndon has chosen fluid (electrical) circuits to transmit movement from certain parts to certain others. In the devices of defendant fluid (oil circuits) are employed to transmit movement from certain parts to certain others.

The testimony of Prof. Cory, Dean of the College of Mechanics of the University of California, and appearing in the transcript, pages 2334 to 2345, is convincing on the equivalence of the two devices. See also Def. Expert Berry, 899, latter part of Ans. 5, also 1310, Ans. 867.

The accompanying diagram of energy fluid circuits of infringing structures is self-explanatory on this point. The figures are the same as appear on similar parts of the Lyndon diagrammatic drawing, Fig. 1 of the patent in suit.

We have here inserted photographic copies of Complainant's Exhibits E, F, H, I, J, K, U and V, to facilitate the reading of the record thereon.

The testimony on infringement and the infringing apparatus appears more particularly as follows:

Complainant's Exhibits illustrating the defendant's apparatus and descriptions thereof and comparison with the Lyndon patent. Scattergood, T. p. 171 to 179, 537; by Heinze, 192, 193; Henry, 134 to 143, and 148 to 156, 297, 216 to 225, 207, 315; Cory, 265, 279, 411, 440, 443, 490, 430, 431, 433, 437; Lyndon, 1946 to 1954. Defendant's Expert Cobb, 643, 873, 874, 878, 879.

*Defendant's Witness McAfee, who operated the devices for years, and who is the only witness who is shown to have had any positive knowledge of the operation of the infringing machines, has given a very clear and logical account of how the parts worked, and while his entire deposition is of interest, the following is particularly pertinent: T. p. 1545, Ans. 34; 1548, Ans. 47, re Lyndon Claim 6; 1549, Ans. 50, re Lyndon Claim 7.*

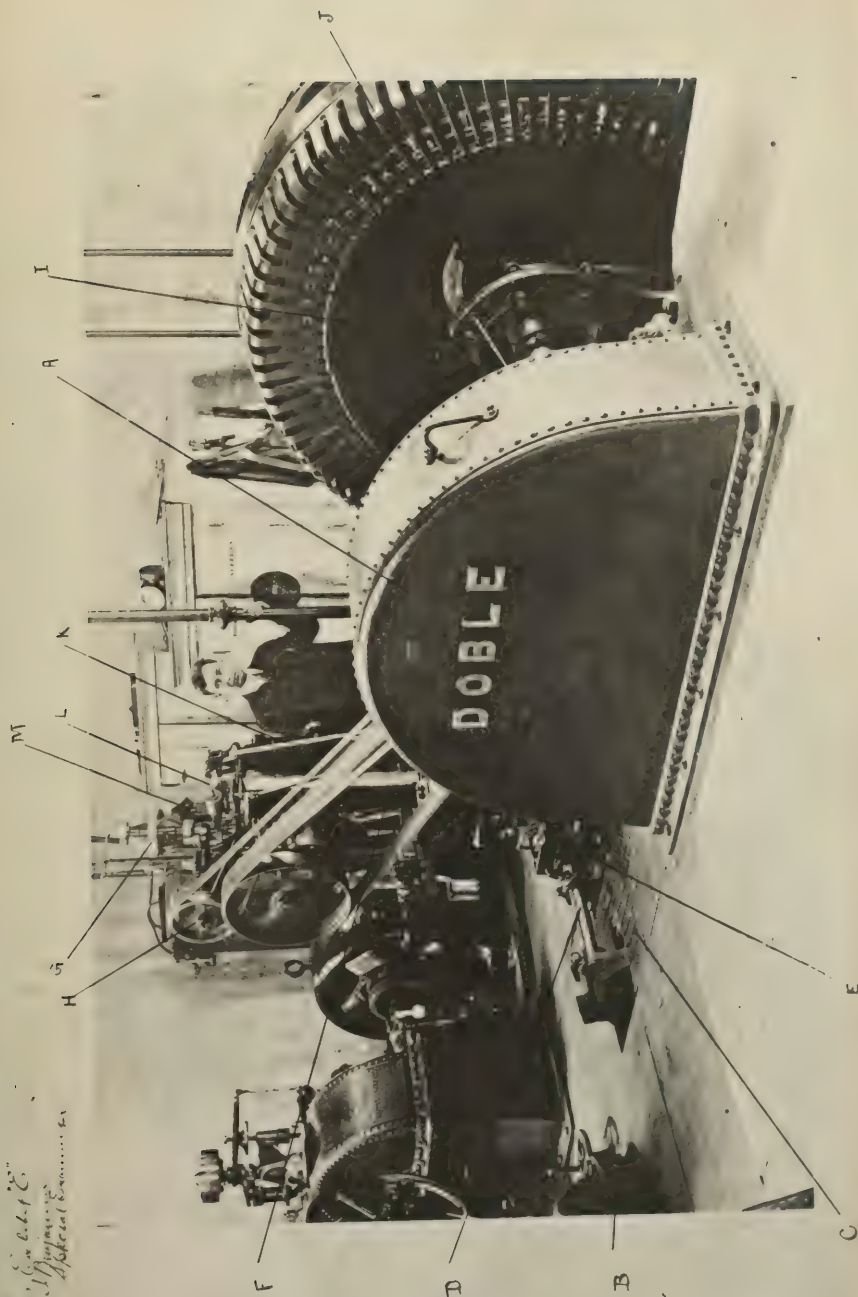
Continuous use, 1581, 1582, 1583, and general operation 1555 to 1572. Adjustment of the bypass, 1593; not used for water economy but to prevent pressures, 1591. See also Def. Expert Berry, 1131.

Def. Expert Cobb, as to the Lyndon claims, 643, 873, 874, 878, 879.

Def. Expert Berry concedes the infringing apparatus acts as a bypass discharging water *during* governor action, 1040, 1041, 1042, 1043, and that said bypass is to relieve the inertia pressures, 1131.

It is immaterial that gearing is shown in the patent in suit for setting up a proper drive relation to actuate the water gate and by-pass valve, and that a hydraulic cylinder and piston is used in the defendant's devices. Equivalence clearly exists, as

W. S. Bond, Co. 1, 1st Reg. Minn. Inf.  
 California 2nd Div. Cavalry  
 Co. of Heavy Artillery  
 City of Los Angeles  
 1st Reg. Minn. Inf.  
 Special Em.



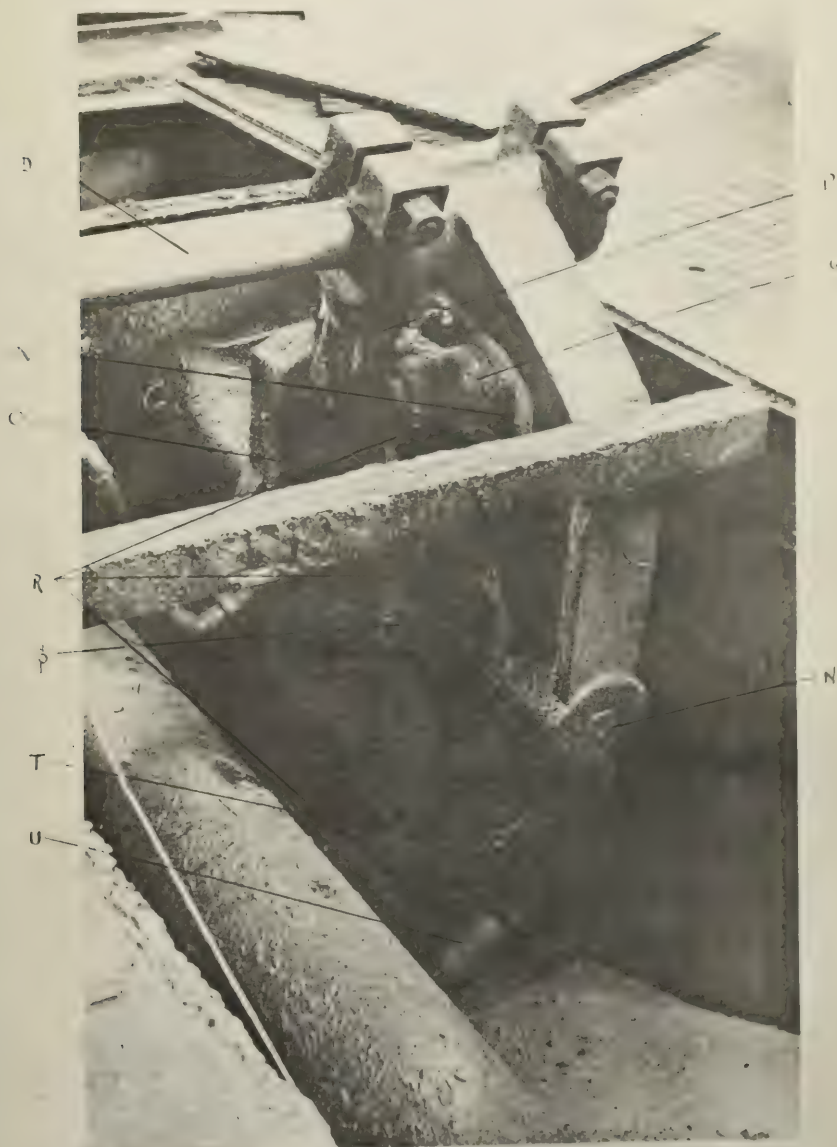




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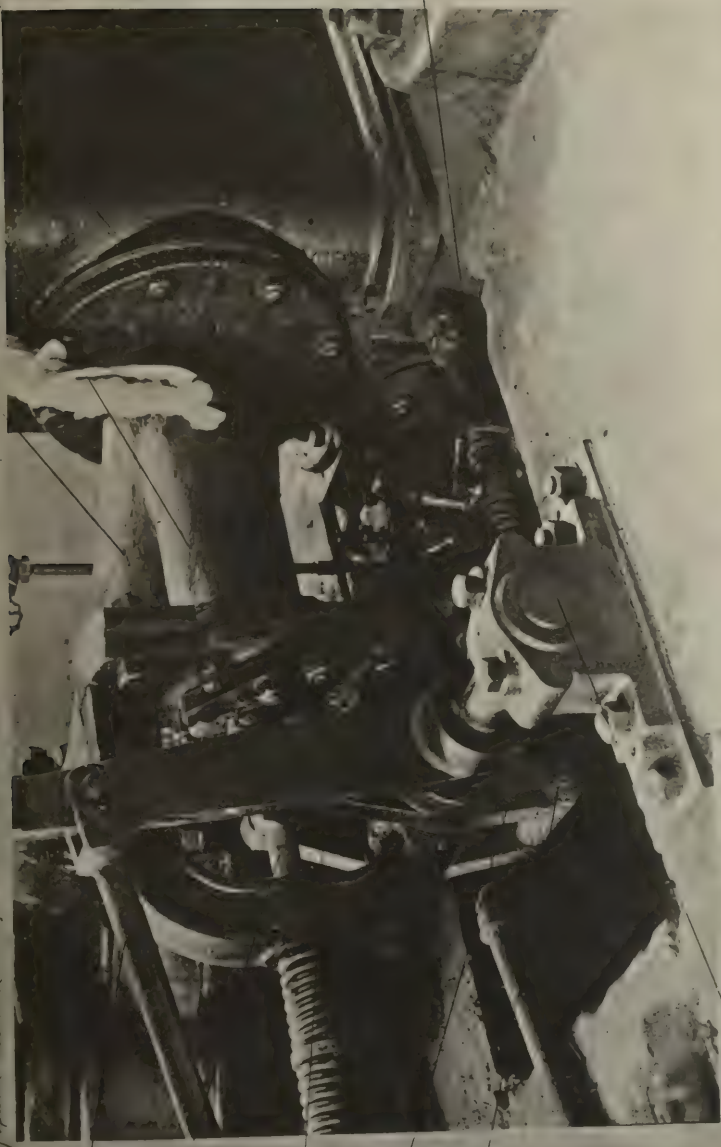


*27 B. West End, San Francisco  
 California, Southern Railway  
 Co. / Albany, Ga. Cont. } No. 17-11.  
 City of San Francisco, Cal.  
 Complaints Exhibit 1.  
 Jan 15, 1911 of Proceedings  
 Special Examiner*

FILED

JUN 1 1911  
 Wm. M. VAN DYKE, Clerk  
 U.S. District Court  
 Southern Railway

aa      ss      oo      pp      rr      ww      aa



ii      mm      kk      nn      rr

ll



AA

TT

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TT

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SS

MM

FILED

91

WM. M. VAN DUSEN, CLERK

Jan 11, 1920

U.S. Dist. Court, Southern Dist.  
 of California at San Francisco  
 Geo. H. Meyer, Jr., Corp. (Plaintiff)  
 City of Los Angeles, (Def't)  
 California, et al. (Def'ts)

DD

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Hand operating lever ZZ

XX

VV

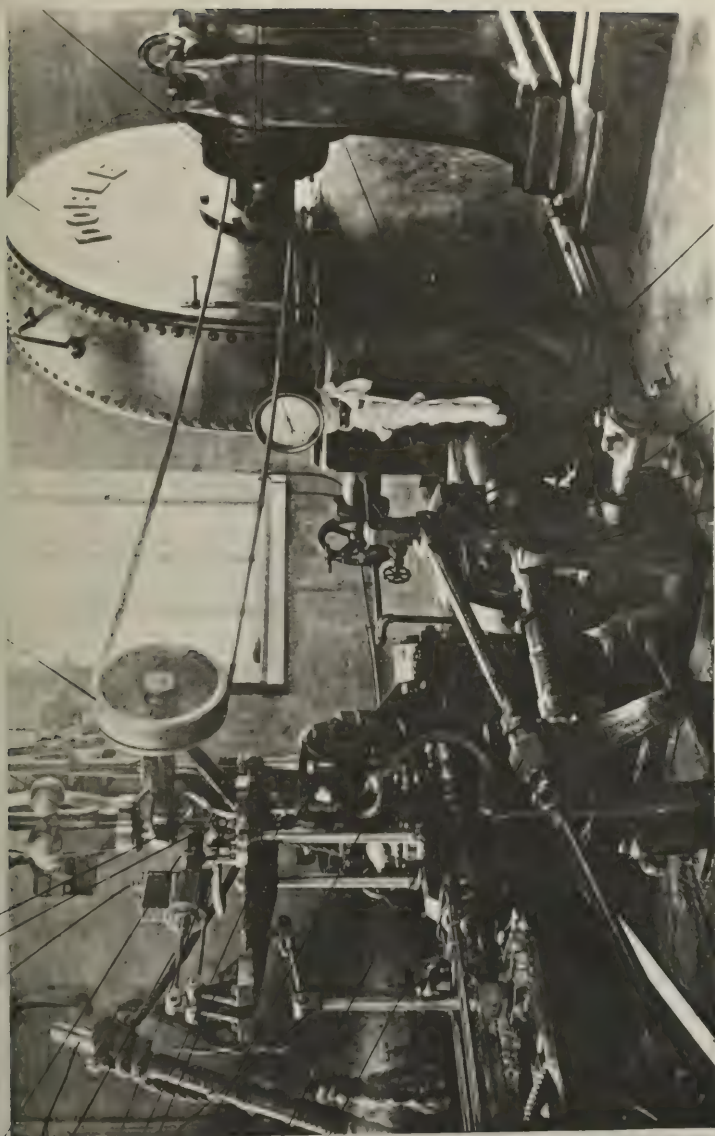
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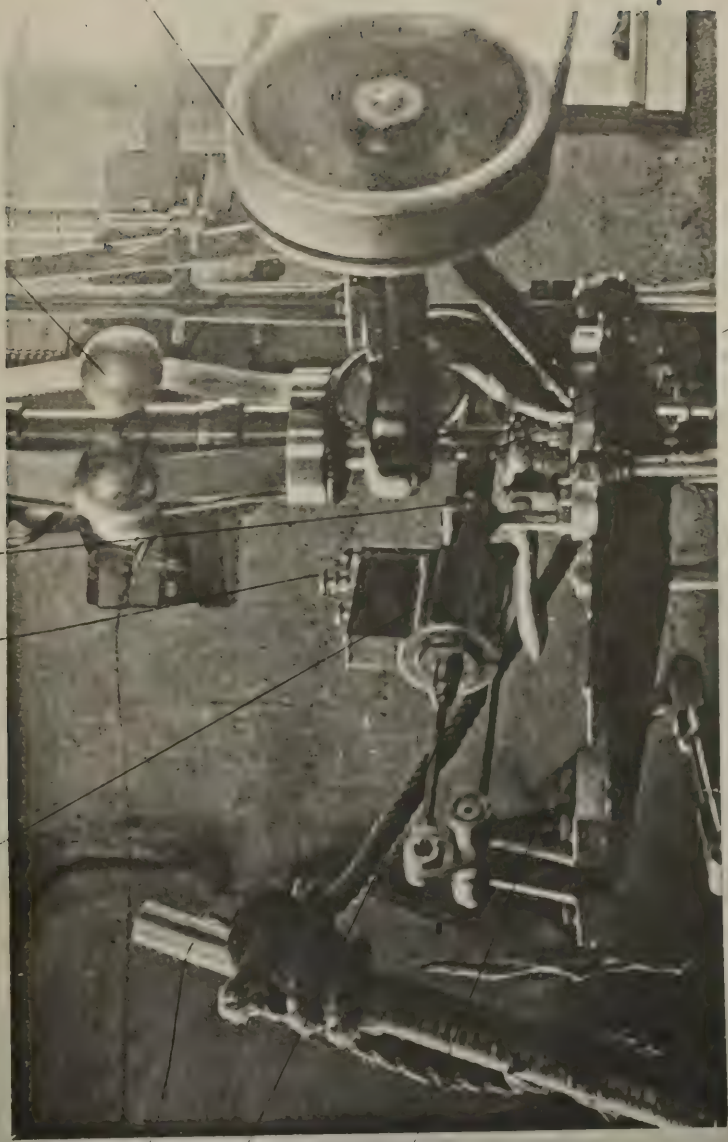


FILED

1931

W.M. VAN DYKE, CHIEF  
By \_\_\_\_\_  
Patent Office

Hand Operating Lever  
City of Los Angeles Dist. No. 674  
Comptroller's Office  
Jan 1 1931



Hand operating lever

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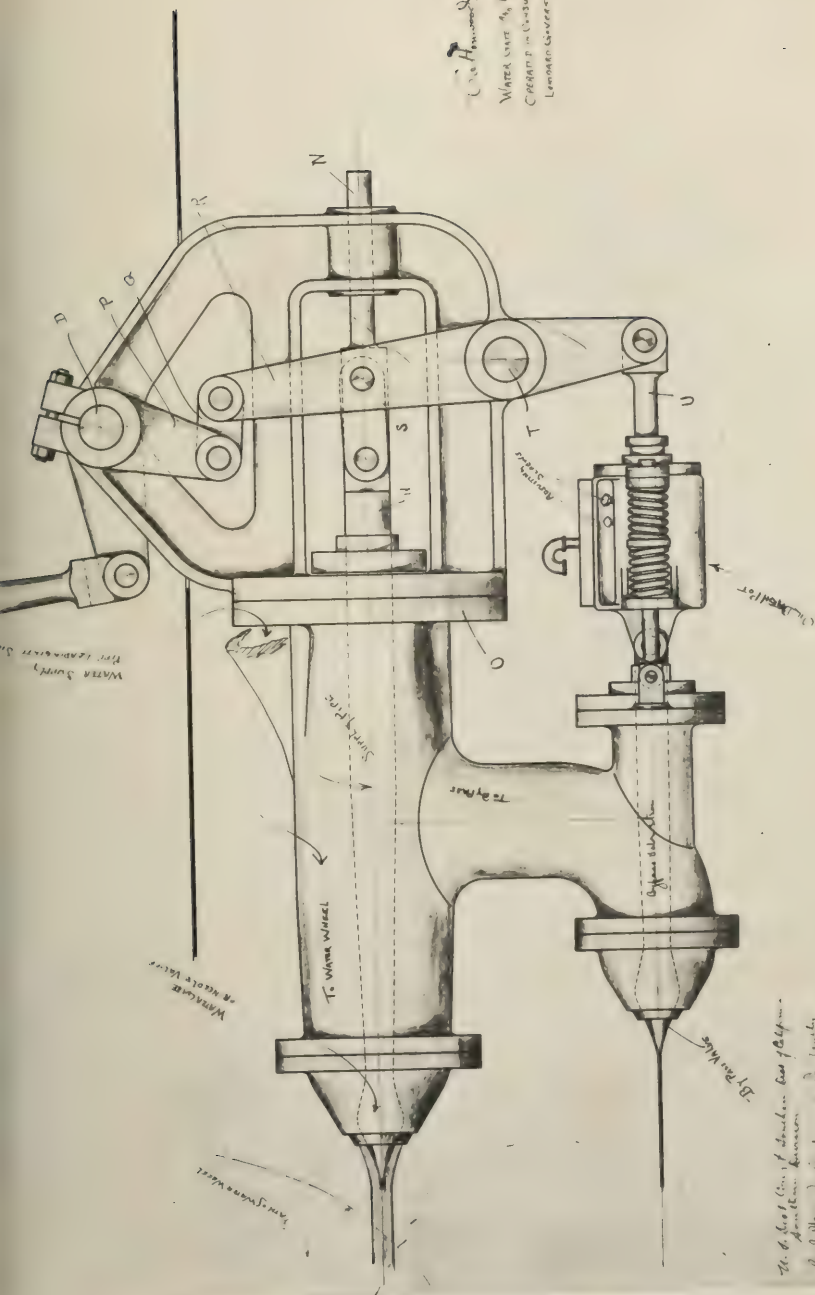
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VV



11

WATER VAPOR  $H_2O$  BY PAIR FEATURES  
C-PEAT in "CONJUNCTION" with TYPE R  
LOWMORCOVERS



U. S. Nat. Hist. of Southern Coast of California -  
Southern Division  
Wm. J. Mann, President.  
Bdry of Los Angeles Co. Sept. 17, 1911

(Supplement to the book of  
 Henry Louis Conway, Baltimore,  
 1842. 1843. 1844. 1845. 1846. 1847. 1848. 1849. 1850. 1851. 1852. 1853. 1854. 1855. 1856. 1857. 1858. 1859. 1860. 1861. 1862. 1863. 1864. 1865. 1866. 1867. 1868. 1869. 1870. 1871. 1872. 1873. 1874. 1875. 1876. 1877. 1878. 1879. 1880. 1881. 1882. 1883. 1884. 1885. 1886. 1887. 1888. 1889. 1890. 1891. 1892. 1893. 1894. 1895. 1896. 1897. 1898. 1899. 1900. 1901. 1902. 1903. 1904. 1905. 1906. 1907. 1908. 1909. 1910. 1911. 1912. 1913. 1914. 1915. 1916. 1917. 1918. 1919. 1920. 1921. 1922. 1923. 1924. 1925. 1926. 1927. 1928. 1929. 1930. 1931. 1932. 1933. 1934. 1935. 1936. 1937. 1938. 1939. 1940. 1941. 1942. 1943. 1944. 1945. 1946. 1947. 1948. 1949. 1950. 1951. 1952. 1953. 1954. 1955. 1956. 1957. 1958. 1959. 1960. 1961. 1962. 1963. 1964. 1965. 1966. 1967. 1968. 1969. 1970. 1971. 1972. 1973. 1974. 1975. 1976. 1977. 1978. 1979. 1980. 1981. 1982. 1983. 1984. 1985. 1986. 1987. 1988. 1989. 1990. 1991. 1992. 1993. 1994. 1995. 1996. 1997. 1998. 1999. 2000. 2001. 2002. 2003. 2004. 2005. 2006. 2007. 2008. 2009. 2010. 2011. 2012. 2013. 2014. 2015. 2016. 2017. 2018. 2019. 2020. 2021. 2022. 2023. 2024. 2025. 2026. 2027. 2028. 2029. 2030. 2031. 2032. 2033. 2034. 2035. 2036. 2037. 2038. 2039. 2040. 2041. 2042. 2043. 2044. 2045. 2046. 2047. 2048. 2049. 2050. 2051. 2052. 2053. 2054. 2055. 2056. 2057. 2058. 2059. 2060. 2061. 2062. 2063. 2064. 2065. 2066. 2067. 2068. 2069. 2070. 2071. 2072. 2073. 2074. 2075. 2076. 2077. 2078. 2079. 2080. 2081. 2082. 2083. 2084. 2085. 2086. 2087. 2088. 2089. 2090. 2091. 2092. 2093. 2094. 2095. 2096. 2097. 2098. 2099. 2100. 2101. 2102. 2103. 2104. 2105. 2106. 2107. 2108. 2109. 2110. 2111. 2112. 2113. 2114. 2115. 2116. 2117. 2118. 2119. 2120. 2121. 2122. 2123. 2124. 2125. 2126. 2127. 2128. 2129. 2130. 2131. 2132. 2133. 2134. 2135. 2136. 2137. 2138. 2139. 2140. 2141. 2142. 2143. 2144. 2145. 2146. 2147. 2148. 2149. 2150. 2151. 2152. 2153. 2154. 2155. 2156. 2157. 2158. 2159. 2160. 2161. 2162. 2163. 2164. 2165. 2166. 2167. 2168. 2169. 2170. 2171. 2172. 2173. 2174. 2175. 2176. 2177. 2178. 2179. 2180. 2181. 2182. 2183. 2184. 2185. 2186. 2187. 2188. 2189. 2190. 2191. 2192. 2193. 2194. 2195. 2196. 2197. 2198. 2199. 2200. 2201. 2202. 2203. 2204. 2205. 2206. 2207. 2208. 2209. 2210. 2211. 2212. 2213. 2214. 2215. 2216. 2217. 2218. 2219. 2220. 2221. 2222. 2223. 2224. 2225. 2226. 2227. 2228. 2229. 2230. 2231. 2232. 2233. 2234. 2235. 2236. 2237. 2238. 2239. 2240. 2241. 2242. 2243. 2244. 2245. 2246. 2247. 2248. 2249. 2250. 2251. 2252. 2253. 2254. 2255. 2256. 2257. 2258. 2259. 2260. 2261. 2262. 2263. 2264. 2265. 2266. 2267. 2268. 2269. 2270. 2271. 2272. 2273. 2274. 2275. 2276. 2277. 2278. 2279. 2280. 2281. 2282. 2283. 2284. 2285. 2286. 2287. 2288. 2289. 2290. 2291. 2292. 2293. 2294. 2295. 2296. 2297. 2298. 2299. 2300. 2301. 2302. 2303. 2304. 2305. 2306. 2307. 2308. 2309. 2310. 2311. 2312. 2313. 2314. 2315. 2316. 2317. 2318. 2319. 2320. 2321. 2322. 2323. 2324. 2325. 2326. 2327. 2328. 2329. 2330. 2331. 2332. 2333. 2334. 2335. 2336. 2337. 2338. 2339. 2340. 2341. 2342. 2343. 2344. 2345. 2346. 2347. 2348. 2349. 2350. 2351. 2352. 2353. 2354. 2355. 2356. 2357. 2358. 2359. 2360. 2361. 2362. 2363. 2364. 2365. 2366. 2367. 2368. 2369. 2370. 2371. 2372. 2373. 2374. 2375. 2376. 2377. 2378. 2379. 2380. 2381. 2382. 2383. 2384. 2385. 2386. 2387. 2388. 2389. 2390. 2391. 2392. 2393. 2394. 2395. 2396. 2397. 2398. 2399. 2400. 2401. 2402. 2403. 2404. 2405. 2406. 2407. 2408. 2409. 2410. 2411. 2412. 2413. 2414. 2415. 2416. 2417. 2418. 2419. 2420. 2421. 2422. 2423. 2424. 2425. 2426. 2427. 2428. 2429. 2430. 2431. 2432. 2433. 2434. 2435. 2436. 2437. 2438. 2439. 2440. 2441. 2442. 2443. 2444. 2445. 2446. 2447. 2448. 2449. 2450. 2451. 2452. 2453. 2454. 2455. 2456. 2457. 2458. 2459. 2460. 2461. 2462. 2463. 2464. 2465. 2466. 2467. 2468. 2469. 2470. 2471. 2472. 2473. 2474. 2475. 2476. 2477. 2478. 2479. 2480. 2481. 2482. 2483. 2484. 2485. 2486. 2487. 2488. 2489. 2490. 2491. 2492. 2493. 2494. 2495. 2496. 2497. 2498. 2499. 2500. 2501. 2502. 2503. 2504. 2505. 2506. 2507. 2508. 2509. 2510. 2511. 2512. 2513. 2514. 2515. 2516. 2517. 2518. 2519. 25









in *Ries, et al. v. Baith Manufacturing Co.*, 136 Fed. 850 (*supra*), and in the further most pertinent case decided by the Supreme Court, *Blake v. Robertson*, 94 U. S. 732, of this, and in this connection, *Walker on Patents*, 4th edition, page 311~~4~~, says:

“However, in one case, the Supreme Court went to the length of deciding a confined column of water in a cylinder, worked by a pump and working a piston, to be an equivalent of a combination of a vibrating arm, toggle joint, and other mechanical devices, when used to transmit vibratory power.”

This case substantiates our contention as to equivalents, and we have still to bear in mind the tremendous scope and breadth of the claim of the patent in suit, and that the specific showing of the drawings of the patent in suit is merely the one form used by the patentee in illustrating his basic invention.

Complainant's exhibits KKK and KK show respectively in detail the infringing structures at the two plants of the Los Angeles aqueduct and references are pasted on Ex. KK to show the application of the several claims thereto. (The figures following the letters refer to the claim number in each instance. Taking the letters in sequence will be found the elements of each respective claim. Thus A3, B3, C3, D3, and E3 are the specific elements in the Lyndon claim 3.) There is no substantial departure between the two plants of defendant, all of the elements being equally found in both. T. p. 162, 411, 412, 413, 472, 473.

The testimony clearly shows the utilization by defendant of the invention of the patent in suit, to obtain the same results in the same manner, and by clearly equivalent means, or by such means as are thoroughly and broadly and properly covered by claims 3, 4, 6, 7 and 8. Unless these claims are infringed by defendant's structures the whole system of protecting inventions by patents becomes farcical. Either Lyndon's invention must be found to be broadly covered, or else the government entered into an unconscionable contract with Lyndon, a contract based upon false pretensions and for which Lyndon paid his fees to the government upon the basis of such false representation by the latter. We respectfully assert this, under the doctrines of all the leading cases, pertinent to the proper breadth of protection of broad and basic inventions. T. p. 207, 265, 443, 537.

It is to be noted that defendant utilized the same elements *in kind, character, performance and accomplishment of result, that are claimed in the Lyndon patent, such as the water gate, by-pass valve, inverse operating means for the water gate and by-pass valve, means for slowly returning the by-pass to normal position after its movement accompanying the movement of the water gate, and the various elements acting to prevent over-running of the governor.*

Surely a patentee must be protected as against the use by another of the very devices falling within the language allowed him in his claims.

## THE CLAIMS OF THE LYNDON PATENT



## APPLIED DIRECTLY TO THE INFRINGING STRUCTURES.

[The letters following the elements of each claim are to be found on Division Creek and Cottonwood apparatus, and inserted at the corresponding element on the illustrations between pages 56 and 57.]

### LYNDON CLAIM (3).

In a water wheel governor, the combination with a water-gate-operating shaft **(A)**, and means for operating same in either direction to govern the water wheel **(B)**, of a controller for said operating means, responsive to changes of speed of the water wheel **(C)**, a returning device for said controller provided with a clutch connection to said operating shaft **(D)**, and means, actuated by said controller on movement thereof from normal position to engage said clutch with the said shaft, so as to cause the return of the controller to normal position and interrupt the governing action before it has over-run the proper amount, substantially as and for the purpose set forth **(E)**.

### LYNDON CLAIM (4).

In a water-wheel governor, the combination with a water-gate-operating shaft **(A)**, a driving shaft **(F)** and reversing clutch-gear, adapted to turn the water-gate-operating shaft in either direction **(B)**, a controller, responsive to changes of speed of the

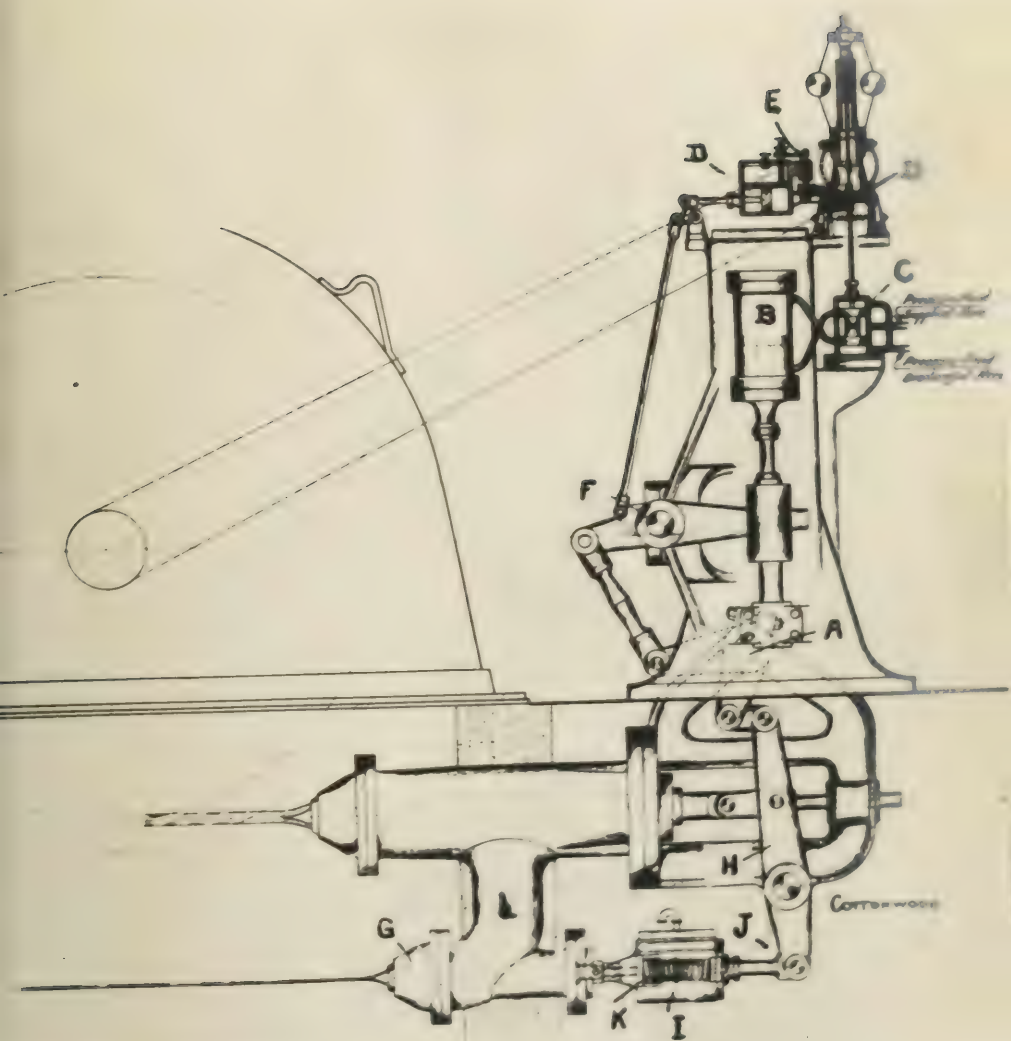
water-wheel and controlling such reversing-gear **(C)**, and a returning device for said controller **(D)** provided with actuating means controlled by said controlling means to return the controller to inoperative position, so as to prevent excessive movement of the governor **(E)**.

#### LYNDON CLAIM (6).

In a water-wheel governor, the combination with means for operating the water-gate in either direction **(B)**, a by-pass for the water-wheel **(L)**, and a valve controlling said by-pass **(G)**, of means connected to the water-gate-operating means and operating the by-pass valve inversely to the operation of the water-gate **(H)**, **(I)**, **(J)**.

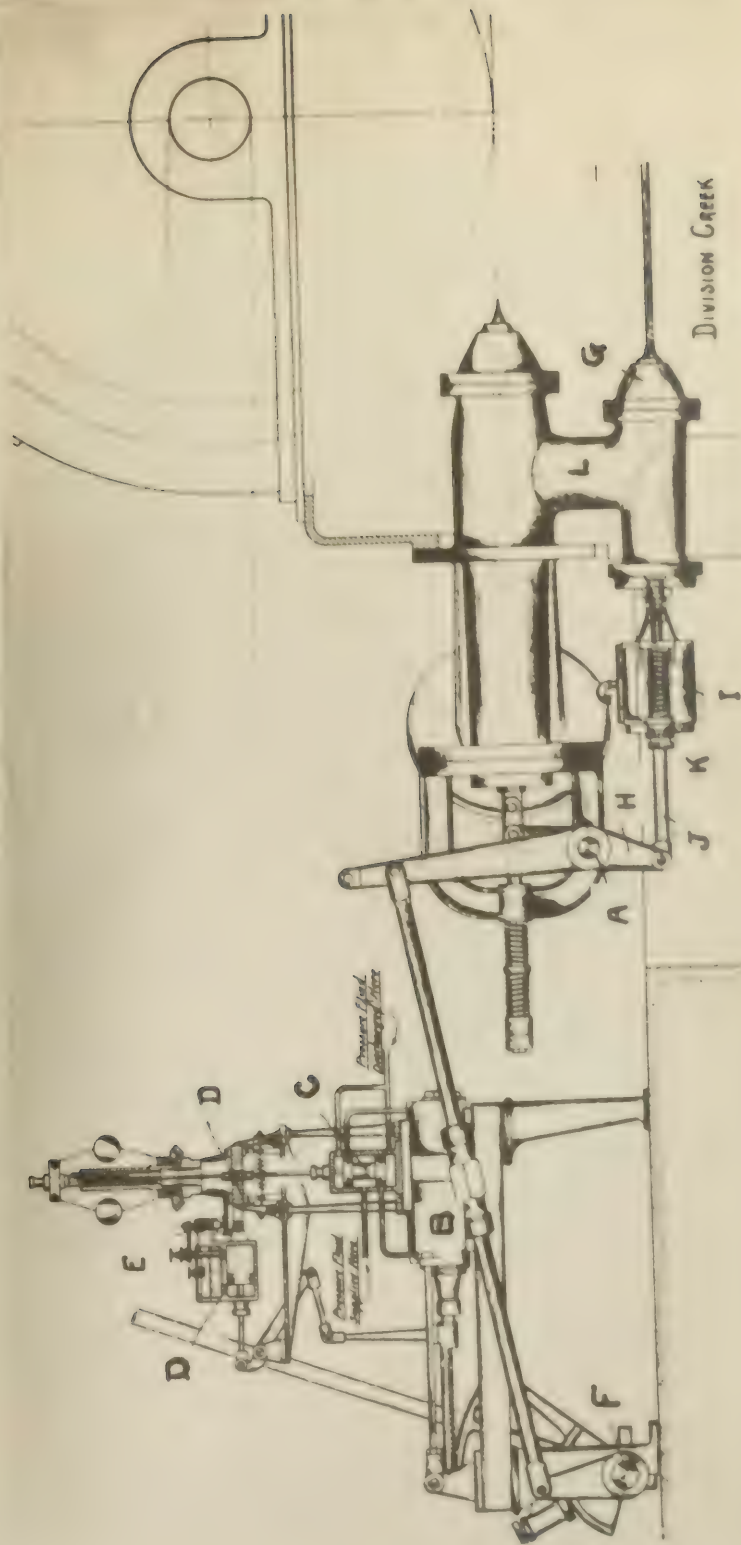
#### LYNDON CLAIM (7).

In a water-wheel governor, the combination with means for operating the water-gate in either direction from normal position **(B)**, a by-pass for the water-wheel **(L)**, and a valve for such by-pass **(G)**, of means connected to the water-gate-operating means and adapted to operate the by-pass valve from normal position in either direction, so as to control such valve inversely to the control of the water-gate, during the governing action of the water-gate **(H)**, **(I)**, **(J)**, and means for returning the by-pass valve to normal position on completion of governing movement of the water-gate-operating means **(K)**.











## LYNDON CLAIM (8).

In a water-wheel governor, the combination with a shaft for operating the water-gate in either direction from normal position (**A**), a by-pass for the water wheel (**L**), and a valve for such by-pass normally held in partly-open position (**G**), of an operating device for said valve (**J**) provided with means for returning the valve to normal position (**K**), a clutch, adapted to connect said operating device (**K**) for the by-pass valve with the water-gate-operating shaft to control the by-pass valve inversely to the water-gate (**I**), reversing means for operating the water-gate-operating shaft in either direction (**B**), a controller, responsive to the speed of the water-wheel and controlling said reversing means (**C**), and means operated by said controller to bring the afore-said clutch into operation and to release said clutch when the governing action is effected (**H**).

The Courts have repeatedly said that where the claims of the patent read clearly upon the defendant's structure, and the gist or kernel or effect of the invention is clearly present in the latter, infringement must be found. On this point we call the Court's particular attention to the following authorities:

Walker on Patents, at the end of section 346, 4th edition, page 304, as follows:

“Harmoniously with its decision in *Burr v. Duryee*, the Supreme Court has since had a positive tendency to disregard whatever is abstract

and intangible in questions of infringement, and to base its conclusions upon the concrete features of the issues at bar.”

It is said in *Scott et al. v. Fisher Knitting Mach. Co. et al.*, 145 F. 915, 918 (2nd Cir. 1906),

“A patentee is entitled to all the beneficial uses to which his invention can be put and in order to hold an infringer it is not necessary that he should indicate every use in his statement of the objects of his invention.”

In the recent case of *Jackson Fence Co. v. Peerless Wireless Fence Co.*, 228 Fed. 691, at p. 692, syllabus 4:

“A patentee is entitled to the benefit of every function within the scope of the claims and actually possessed by his mechanism, even if he does not know of it at the time of patenting, and it is not necessary that he should enumerate its advantages.”

Also:

“It is not necessary for a patentee to describe in detail all the beneficial functions which he claims will result from his invention; but it is enough if such functions are evident and obviously contribute to the success of the invention, and they may in such case properly be taken into account, in estimating its novelty and utility. (Decree 146 F. 552 reversed.)”

*General Electric Co. v. Bullock Electric Mfg. et al.*, 152 F. 427 (6th Cir. 1907).

“A patentee who has sufficiently described and distinctly claimed his invention is entitled



to every use to which his device can be applied, whether he perceived or was aware of all such uses at the time he secured his patent or not. (For other cases, see Patents, Cent. Dig., Sec. 263; Dec. Dig., Sec. 185.)”

Acme Truck & Tool Co. v. Meredith, 183 F. 124.

“A patentee is entitled to have his patent considered with reference to an advantage over the prior art necessarily secured by the operation of the device as described, even though such advantage is not specifically claimed or fully set forth in the specification. (For other cases, see Patents, Cent. Dig., Sec. 241; Dec. Dig., Sec. 165.)”

Morgan Engineering Co. v. Alliance Mach. Co., 176 F. 100.

“An inventor is entitled to all that his patent fairly covers, even though the complete capacity is not recited in the specification and was unknown to him prior to the patent issuing. (For other cases, see Patents Cent. Dig., Sec. 243; Dec. Dig., Sec. 167.)”

Stromberg Motor Devices Co. v. John A. Bender Co., 212 F. 419.

As said in Eck v. Kutz, 132 Fed. 758:

*“The question is whether the inventive idea expressed in the patent has been appropriated; and, if it has, infringement has been made out.”*

Judge Nelson in Tatham v. LeRoy (2 Blatchf. 486), says:

*“Formal changes are nothing,—mere mechanical changes are nothing; all these may be made outside of the description to be found in the patent, and yet the machine, after it had been thus changed in its construction, is still the machine of the patentee, because it contains his invention, the fruits of his mind, and embodies the discovery which he has brought into existence and put into practical operation.”*

As said by the Supreme Court in *Hobbs v. Beach*, 180 U. S. 383:

~~*“If there be one central controlling purpose deducible from all these decisions, and many more that might be quoted, it is the steadfast determination of the court to protect and reward the man who has done something which has actually advanced the condition of mankind, something by which the work of the world is done better and more expeditiously than it was before.”*~~

*“The object of the patent law is to secure to inventors a monopoly of what they have actually invented or discovered, and it ought not to be defeated by a too strict and technical adherence to the letter of the statute or by the application of artificial rules of interpretation.”*

*Topliff v. Topliff*, 145 U. S.

(Our italics. *generally*)

*McLain v. Ortmyer*, 141 U. S. 425:

*“In a case of doubt, where the claim is fairly susceptible of two constructions, that one will be adopted which will reserve to the patentee the actual invention.”*

We also quote from *Ryder et al. v. Lacey*, <sup>200</sup>220 Fed. Rep., page 966, as follows:

(Syl.) "Unless a patentee has especially limited himself to a specific form of construction, or such limitation is imposed by the prior art or by the action of the patent office, acquiesced in by him, he is entitled to a broad construction of his claims *in accordance with the language thereof.*"

*insert*

~~Also~~ on page 514 et seq:

"We find nothing upon the face of the patent requiring the claim to be limited to rolls which had these flanges attached to and integral with the rolls. It is true that neither by drawing nor specification does Fell suggest the performance of this function by stationary parts of the frame, but this is not necessary. In the absence of something clearly showing that the patentee did intend to have his grant confined to a specific form, a broad and generic claim may rightfully stand on a mere specific disclosure; and the invalidity of such a claim (if it is invalid) will result, not from the applicant's failure to use more sweeping language in his specification, but from the state of the art limiting the actual invention. *The claims are part of the description required by statute, and in them, and not in that part of the description which is now commonly called 'specification,' is the proper place in which to define the breadth of the invention, as was most accurately apprehended by Fell's solicitor when he (though quite unnecessarily) said that various changes might be made 'without departing from my invention as defined by the appended claims.'*"

Also we refer to *National Tube Co. v. Mark et al.*, 216 Fed. 507, a decision of the Circuit Court of Appeals of the Sixth Circuit, as follows:

(Syl.) "Where a patent contains both a

broad and a narrow claim, the court cannot construe into it a limitation not therein expressed, but which is expressed in the narrower claim, and by which alone one is distinguished from the other.”

Also, *Hess-Bright Mfg. Co. v. Fitchel et al.*, 219 Fed., at page 729 (C. C. A.), as follows:

“Such being the case, it follows that the claims granted should receive the construction their language naturally imports (*Dodge Needle Co. v. Jones* (C. C.), 153 Fed. 189, and 159 Fed. 715, 86 (C. C. A.) 191), and that no statement or action of the patentee in obtaining his patent estops him from claiming to the full extent what his claims on their face purport.”

It surely will not be necessary in support of our contentions to more clearly point out the leading objects of the invention than to refer to the opening passages of the specification of the patent; in view of the findings and conclusions of the Court (Tr. p. 62), it is evident that the patentee, by his specification and claims and testimony in this case, had in mind the broad and important nature of his invention and that the title of the invention merely specified the particular type of water wheel to which the governor was applicable. That is, the governor was for an *electro-mechanical water wheel*; a water wheel for use in mechanically driving electrical generators. The title fully supports this in its grammatical construction. The question is, however, what was Lyndon's invention? What did he do over the prior art? What did he claim? These questions must be an-



swered in terms of broad interpretation of the patent. Next, does the defendant come within the monopolistic territory of the patent in suit?

*The lower Court says, "The defendant's device has been highly successful from the time of its installation, and since then has been actually producing the useful result claimed for the Lyndon patent." Hence the results are found to be identical.*

A finding of infringement is unavoidable.

The Circuit Court of Appeals for the 7th Circuit, said in a recent decision, 230 F. 157, at page 162:

(3) "In determining an alleged infringement the court should have in mind the true worth of the claim as measured by the inventor's contribution to the art, and should remember that each claim of a patent is in law a separate invention."

The patent in suit contains the broadest kind of claims for an invention clearly copied in substance by the defendant, and there was clearly error in the lower Court's finding of non-infringement of the admittedly valid claims of the patent.

It is to be noted that the record in this case is to a large extent filled with a hair-splitting discussion of the operation of detail parts, caused by an obvious attempt of defendant to make it appear that the Lyndon invention was to be shackled by limiting consideration of such things as immaterial electromagnets and electrical circuits which are merely the well-known expedients for setting mechanical features into operation. Such a large amount of dust of this nature was thrown into the eyes of the trial

Court that defendant succeeded in disrupting, apparently, the high lights of the invention to such an extent that it escaped a finding of infringement due to the resultant impairment of judicial vision. Your Honors, it is believed will not be blinded by any such attempt.

Within the doctrine of *Stebler v. Riverside Heights*, 205 Fed. 735, and the cases cited therein, and the many authorities herein quoted and cited, it is clear that infringement should be found when, as in the case at bar, the substance of the invention has been appropriated by the defendant.

We call the Court's attention particularly to the acquiescence of the patent by Doble and the Pelton Water Wheel Company and the Pacific Gas & Electric Co., as per the following exhibits and papers in the transcript.

As pointed out above, the Pelton Water Wheel Co. petitioned to and were allowed to intervene, filed an answer and an amended answer, participated extensively in the defense, hundreds of pages of defendant's record being taken in the office of its attorneys, and in the presence of its engineer Doble (T. p. 1299-1583-167) and subsequently withdrew on stipulation (T. p. 87) after paying the complainant in this case a large sum of money and other valuable considerations for a license under the patent in suit (T. p. 2480-2484-2486-2504). This company acknowledged fully the validity of the said patent when taking its license; although opposing it earlier when Lyndon called attention to it and asked for an accounting.

(Witness Lyndon T. p. 1974, 1992, 1994, 2003, 2135.)

The Pacific Gas & Electric Corporation also took a license and acknowledged validity of the said patent at the same time as did the Pelton Co.

As soon as an owner of the patent in suit was able financially to enforce the rights granted by the patent (and the record clearly shows that Lyndon never was and also never knew of the infringement in this suit prior to testifying in the case), the largest companies in the manufacture and use of the apparatus of the kind concerned, flew to attack the patent in suit, only to later take licenses thereunder, for valuable consideration, and withdraw from the fight.

While possibly the appellant may not recover as heavily for infringement against the appellee because of the relative minor infringements in Inyo County, as it might because of the larger plants installed for the appellee by the Pelton Water Wheel Company, now a licensee, nevertheless, the appellant and said Pelton Water Wheel Company are, we submit, entitled to an adjudication of the patent as valid and infringed.

~~In closing we wish to quote from Hobbs v. Beach, 180 U. S. 383, bearing in mind how Lyndon revolutionized the art of water wheel governing for hydro-electrical generation and the benefits to mankind resulting. We quote as follows:~~

~~“If there be one central controlling purpose deducible from all these decisions, and many more that might be quoted, it is the steadfast determination of the court to protect and reward the man who has done something which has ac-~~

~~tuallly advanced the condition of mankind some thing by which the work of the world is done better and more expeditiously than it was before."~~

As to the breadth of the patent in suit, the following quotation from the "Fixed Law of Patents," second edition, by Macomber, are highly significant (see pp. 447 and 448):

"Norton being the original inventor, he, and those claiming under him, would have the right to treat as infringers all persons who make devices or machines operating on the same principle and performing the same functions by analogous means or equivalent combinations, even though the infringing machine may be an improvement of the original, and patentable as such.—Norton v. Jensen, 49 Fed. 859; 1 C. C. A. 452; McCormick v. Talcott, 20 How. 405; Wells v. Gill, 1 Ban. & A. 77; Kendrick v. Emmons, 2 Ban. & A. 208; Turrell v. Spaeth, 3 Ban. & A. 458; Colt v. Arms Co., 1 Fish. P. C. 108; Winans v. Railroad, 4 Fish. P. C. 2; Whipple v. Mfg. Co., 4 Fish P. C. 29; Fruit Co. v. Curran, 8 Fed. 150.

With respect to such a patent (a pioneer) the well-settled rule is that the patentee who has, by the success of his patent, pointed out the combination of functions needed to reach the new result, and has claimed the combination of mechanical parts performing those functions, may enjoin the use of another machine producing the same result where the second machine differs from the first only in a substitution, for parts or elements in the patented device, of parts or elements which though different in form and kind, perform the same functions in substantially the same way. It may be that the substituted parts are well known equivalents of those shown in the patent for the performance of the functions



to which they are respectively applied, in which case there is manifestly no inventive faculty shown in the change; or it may be that, being shown by the successful operation of the patent the exact nature of the functions to be performed by a part of the patented device, the infringer by the use of his inventive faculty, hits upon something as a substitute which will perform the same functions more completely and satisfactorily. In the latter case he is a tributary inventor; but he is none the less an infringer if he uses the whole machine, with his substituted parts to accomplish the same new result. The rule as to infringement of pioneer inventions which point the way to new products or results is analogous to that applied in cases of infringements of process patents in which the discoverer is only required to point out one practical method of using his process, and is permitted to claim tribute from all who thereafter use the process, whether with his apparatus or with a different or improved means. In *Machine Co. v. Lancaster*, 129 U. S. 263, the Supreme Court said:

‘Where an invention is of a primary character and the mechanical functions performed by the machine as a whole are entirely new, all subsequent machines which employ substantially the same means to accomplish the same result are infringements, although the subsequent machine may contain improvements in the separate mechanisms which go to make up the machine.—*McCormick v. Aultman*, 69 Fed. 371; 16 C. C. A. 259.’

*Consolidated v. Crosby*, 113 U. S. 157; *Royer v. Belting Co.*, 135 U. S. 319; *Machine Co. v. Murphy*, 97 U. S. 120; *Sessions v. Romadka*, 145 U. S. 29; *Clough v. Barker*, 106 U. S. 160; *Winans v. Denmead*, 15 How. 330; *McCormick v. Talcott*, 20 How. 402; *Railway v. Sayles*, 97 U. S. 554.

All subsequent machines which employ substantially the same means to accomplish the same results are infringements, notwithstanding the subsequent machine may contain improvements in separate mechanisms which go to make up the machine.—*Von Schmidt v. Bowers*, 80 Fed. 121; 25 C. C. A. 323; *McCormick v. Talcott*, 20 How. 402; *Railway v. Sayles*, 97 U. S. 554; *Clough v. Barker*, 106 U. S. 166; *Consolidated v. Crosby*, 113 U. S. 517.”

We quote also from *Walker on Patents*, 4th edition, as follows (pp. 315 to 317):

“There are two tests of equivalency. 1. Identity of function. 2. Substantial identity of way of performing that function. Primary as well as secondary patents are infringed by no substitutions that do not fully respond to the first of these tests. The second of these tests is somewhat elastic, because it contains the word ‘substantial.’ That word is allowed to condone more and more important differences in the case of a primary patent, than in the case of a secondary one. In the case of a patent narrowed in construction by an extensive state of the preceding art, the word ‘substantial’ will give but little elasticity to the application of the doctrine. If fewer inventions preceded the one at bar, the word will have somewhat more of carrying power. When the invention at bar is strictly primary, and especially if it is extremely useful, then the word ‘substantial’ will be made to cover differences alike numerous and important, and even highly creditable to the infringer who invented them.

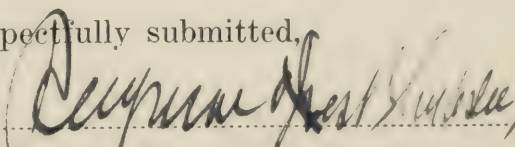
Sec. 363. A change of form does not avoid an infringement of a patent; unless the form shown in the patent is necessary to the functions which the patent ascribes to the invention; or unless that form is the distinguishing characteristic of

the invention or is essential to its patentability; or unless the patentee specifies a particular form as the means by which the effect of the invention is produced, or otherwise confines himself to a particular form of what he describes. Even where a change of form somewhat modifies the construction, the action or the utility of a patented thing, non-infringement will seldom result from such a change." (Cases being cited by the author.)

The ruling announced by the Supreme Court in Adamson v. Gilliland, <sup>243 U.S.</sup> does not apply in the case at bar. In other words, all of the testimony being taken out of Court in deposition form, the whole case, completely, as to both facts and law, comes before your Honors for complete consideration de novo.

The patent stands as a legally granted monopoly, and this legal grant, in its full effect and with its full covenants, should be established and confirmed on behalf of its present owner. The patent is obviously unanticipated and clearly infringed, and reversal of the decree of the lower Court, we submit, is proper with all consideration of law and precedent, equity and good conscience, and it is respectfully solicited that such reversal of the decree be ordered with direction that the relief prayed for in the appellant's bill of complaint be ordered granted, with costs to appellant.

Respectfully submitted,

  
Solicitor and Counsel for Complainant-  
Appellant.





No. 3108.

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United States  
Circuit Court of Appeals,  
FOR THE NINTH CIRCUIT.

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George J. Henry, Jr.,

*Appellant,*

*vs.*

City of Los Angeles,

*Appellee.*

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APPELLEE'S BRIEF.

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ALBERT LEE STEPHENS,  
*City Attorney;*

FREDERICK S. LYON,  
*Special Counsel,*  
*Solicitors for Appellee.*



No. 3108.

United States

# Circuit Court of Appeals,

FOR THE NINTH CIRCUIT.

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George J. Henry, Jr.,

*Appellant,*

*vs.*

City of Los Angeles,

*Appellee.*

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## APPELLEE'S BRIEF.

A reading of the brief filed on behalf of appellant leaves the impression that appellant intends the court to understand that the public has received great benefit from the alleged invention of Mr. Lyndon. Such brief apparently attempts to assert that the Lyndon invention has some place in the art. In fact, on page 2 of the brief, it is said:

"The invention covered by the patent in suit, has been epochal in its effect upon industrial and domestic lighting, heating and cooking, and more particularly so upon the Pacific Coast of the United States, where electro-mechanical energy is generated from the streams having their sources high in the Sierras."

There is no evidence whatever upon which to sustain this statement. On the contrary it is admitted that no device embodying the construction or interrelation of parts set forth in the drawings or described in the specification of the Lyndon patent has ever been made. No such device has ever been used. In no manner is the public actually indebted in the slightest degree to Mr. Lyndon. The Lyndon patent is shown by the record clearly to be a mere paper conception. *The proofs show that from the date of the issuing of the patent in suit, March 11, 1902, until August, 1913,—a period of over eleven years,—not a single device made in accordance with the patent was ever assembled or attempted to be used.*

On cross-examination appellant, testifying in his own behalf, says:

“Q. 185. Now, had any of the installations with which you had anything to do involved governing mechanisms substantially like the means disclosed and described in the Lyndon patent in suit?

A. I think I have already answered that question.

Q. 186. In a broad and general way you have. Perhaps I should make it more specific. Have you ever installed in the course of your engineering experience a governing device which corresponded in all details of construction to that disclosed and shown in the Lyndon patent in suit?

A. No, sir.

Q. 187. Did you ever know of anyone installing a governing device built in exact accordance with the



specifications and drawings of the Lyndon patent in suit?

A. No, sir.

Q. 188. Did you ever know of the installation of a governing device employing a dynamo as shown in this patent in connection with magnets like those shown in 15 and 16, and the solenoid like that shown at 33, and also a magnet like that shown at 32 and at 64, with their connections?

A. As far as your question goes, I might say that I have seen governing devices containing the elements as you have described them. But such governing devices were not in use on water wheel apparatus. The method of using voltage variations as shown in dynamo 8 and solenoid 33 and plunger 34, actuating magnets, is, I believe, in use in various forms of electrical controlling apparatus. And, without being able to say exactly where or when, or driving what, I have seen such apparatus. I know that I have frequently seen it.

Q. 189. But you have never seen it actually in use in the governing of the speed of a water wheel?

A. No, sir; I have not."

[Record, Vol. 1, pages 314-315.]

"Q. 192. While you are familiar with the operation of magnets and electrical connections generally, as you have described, you do not mean to say that you have ever seen a series of magnets and contacts connected up as shown in this Lyndon patent?

A. I can't say whether I ever have or have not seen a set connected up exactly as shown in the Lyndon

patent, but I have seen so many magnets and solenoids operate in conjunction with contacts, that the manner in which such magnets and contacts and solenoids and dynamos would work in the Lyndon patent is easy to understand.”

[Record, Vol. 1, p. 316.]

Appellant’s witness, Prof. C. L. Cory, testifies as follows:

“Q. 427. By Mr. Westall: With the disclosures of the Lyndon patent before the public for approximately eleven years, have you ever known in all your engineering experience of a single electro-mechanical governor constructed and installed or practically used for the purpose of accomplishing the results of water-wheel regulation made out by Lyndon, constructed in exact accordance with the drawings and the specifications of the Lyndon patent in suit.

A. No; I know of none constructed in exact accordance with the details set forth by Lyndon.

Q. 428. Have you known of any employing the same number of magnets and solenoids and the same general arrangement of springs, circuits and dynamos?

A. Yes, sir; I have known of some that were used practically—perhaps not operating the same number—but operating upon the same general electro-mechanical principles.

Q. 429. Where have you known of these devices being used?

A. At various plants on the Pacific Coast, notably the Folsom Power Company on the American River

near Sacramento, the San Joaquin Power Company, the Utah Light & Power Company, and the Pelluride Power Company in Utah and Colorado.

Q. 430. Did they have this dynamo described by Lyndon?

A. They had the essential characteristics of the dynamo.

Q. 431. They did have a dynamo for the same purpose and in the same position?

A. I don't know.

Q. 432. By Mr. Westall: Did they have a solenoid corresponding to the solenoid 33 and close the circuits in the same general position?

A. They had solenoids and circuits, but I don't know and, in fact, I don't believe they operated in the same detail as set forth in the Lyndon patent, but they were known as electrical governors.

Q. 433. So that I understand that there were in operation certain devices known as electrical governors, but you do not know of any that were constructed with the same number of magnets and the same arrangement of circuits as Lyndon discloses?

A. No.

Q. 434. By Mr. Westall: So that you have never had an opportunity of seeing the actual operations of the device constructed in accordance with the Lyndon drawings?

A. No, sir; I never have."

[Record, Vol. 2, pages 499-501.]

Lamar Lyndon, the alleged inventor and the owner of the patent in suit up to July 7, 1913, called for appellant, testifies:

“XQ. 291. By Mr. Westall: Did any of the concerns against which you threatened suit make, sell or use any device, which might properly be described by the claims Nos. 6 and 7 of the Lyndon patent in suit?

A. I had never seen a governor in which the elements shown in claims 6 and 7 were present, so far as I know, and my claims on the various companies which I alluded to were made on the basis of statements which came to me that equivalent constructions were being used.”

[Record, Vol. 5, page 1981.]

“XQ. 490. By Mr. Westall: There has never been a model or device of an electro-mechanical water-wheel governor constructed in accordance with the drawings and specifications of the patent in suit, has there?

A. I do not know from having seen one that a water-wheel governor has ever been constructed in accordance with all of the disclosures of my invention. I consider that nearly all of the operative governors which I know or which I have any information concerning, make use of some one or more of the elements which I have disclosed in the patent in suit. That is the answer to your question on the assumption that you refer to principles of governing. If you refer to the construction of a governor using all of the principles of governing which I have revealed in this patent, and, furthermore, the specific design of parts disclosed in it and using electro-mechanical means of



operation, together with electro-magnetic speed-responsive devices. I do not know of any governor made in accordance with all of these surrounding conditions that was ever completed, although, as I have previously testified, most, if not all of the parts of one, were made, but never assembled.

XQ. 491. By Mr. Westall: Has there ever been constructed to your knowledge an electro-mechanical water-wheel governor comprising the combination with means of operating the water gate in either direction, a by-pass for the water wheel, and a valve controlling said by-pass, of means connected to the water-gate-operating means and operating the by-pass valve inversely to the operation of the water gate?

A. Not to my knowledge.

XQ. 492. By Mr. Westall: Without quoting in its entirety the language of claim 7 of the patent in suit (which I now place before you), I will ask you if you have ever known of an electro-mechanical water-wheel governor containing within it or comprising the combination of elements of said claim 7 or to which the language of claim 7 might otherwise be properly descriptive and applicable?

A. I do not personally know of any water-wheel governor such as you describe in your question.

XQ. 493. By Mr. Westall: Have you ever known of a governor for water wheels employing as a speed-sensitive device or containing within it as part of its mechanism a dynamo wound to maintain constant potential for varying currents therein but to vary the potential in a greater ratio than the speed?

A. I do not now recall any governor having such speed-controlling means.

XQ. 494. By Mr. Westall: Have you ever heard of an electro-mechanical water-wheel governor containing within it as part of its mechanism a reversing clutch gear adapted to connect the water-gate-operating shaft and the driving shaft in reverse driving relations?

A. Yes. The Geisler governor which at one time was manufactured by the Stillwell-Bierce & Smith-Vaile Company, now the Platt Iron Works of Dayton, Ohio.

XQ. 495. By Mr. Westall: Do you remember approximately when you heard of such a device and when it was made and used?

A. I have seen these governors in operation and, as nearly as I can remember, the first one I ever saw was in 1901 or 1902.

XQ. 496. There has never been constructed to your knowledge any electro-mechanical governor containing the precise number of magnets, solenoids, arrangement of contracts and circuits such as are illustrated in Fig. 1 of the patent in suit, has there?

A. Never to my knowledge."

[Record, Vol. 6, pages 2080-2083.]

See also testimony of defendant's witness, Edward S. Cobb, who testified:

"Q. 62. From the date of the Lyndon application, September 13, 1900, to date, have you ever known of a single water wheel governing device constructed in

accordance with the Lyndon specifications and drawings?

A. I have not."

[Record, Vol. 2, page 596.]

and defendant's witness, S. L. Berry, who testified:

"Q. 33. Have you ever known of a governor such as is illustrated in figure 1 of the Lyndon drawings, or such as corrected and lettered in Complainant's Exhibit C, being installed and being practically used anywhere?

A. I have never seen such a governor."

[Record, Vol. 3, page 913.]

Two concerns at different times since the grant of the patent in suit became interested in, investigated, even took steps toward constructing a model, but abandoned it.

See testimony of Lamar Lyndon, Record, Vol. 5, page 1903, answer to question 171; page 1906, answer to question 174.

Under these circumstances the assertions of appellant's brief are shown to be highly misleading in character. The purpose of such misleading statement is apparent when it is borne in mind that the courts give favorable consideration to inventions which have gone into general public use and have been proven of beneficial character to the public. It is a well recognized rule of law often applied by this court that where the device of a patent has gone in general or extended use the invention is entitled to the beneficent consideration of the court. *However, the fact that the device of a*

*patent has never been used at all applies the converse of this rule.* This is most aptly referred to by Circuit Judge Lurton, speaking for the Circuit Court of Appeals for the Sixth Circuit, in *National Malleable Castings Co. v. Buckeye M. I. & C. Co.*, 171 Fed. 847, at page 852, as follows:

“The whole ground, for the purpose for which we use the fact of no commercial use, is covered by the admission of Mr. Deitz that no couplers like the patent in suit have ever been put into actual service. The mere fact that a patent has not gone into practical use does not defeat it, nor deprive the patentee of relief in equity against an infringer. The patentee may, if he will, reserve the invention for his exclusive use, or he may suppress it if he elect. It is his private property for the time of the monopoly. *Heaton Peninsular Company v. Eureka Specialty Co.*, 77 Fed. 294, 25 C. C. A. 267, 35 L. R. A. 728; *Paper Bag Cases*, 210 U. S. 405, 28 Sup. Ct. 748, 52 L. Ed. 1122. *The use we make of the fact that the device has never gone into actual service is in the construction or interpretation of the patent. We are justified, in view of the facts of this case, in exercising much caution in attributing to this patent anything more than is plainly shown and distinctly claimed.* *Bradford v. Belknap Motor Company (C. C.)* 105 Fed. 63; *Crown Cork & Seal Co. v. Aluminum Co.*, 108 Fed. 845, 48 C. C. A. 72. *This inference from nonuse, under the circumstances, is the converse of the inference drawn in respect of a doubtful patent when a showing is made that it has gone into large use and has displaced other devices. It is an infer-*



*ence against utility from the fact of long nonuse, unexplained by want of means or opportunity.”*  
(Italics ours.)

See further the opinion of Circuit Judge Putnam, in the leading case of *Bradford v. Belknap Motor Co.*, 105 Fed. 63. Particularly third paragraph on page 64.

The Circuit Court of Appeals for the Sixth Circuit, in *Westinghouse E. & Mfg. Co. v. Toledo, P. C. & L. Ry. Co.*, 172 Fed. 371, says:

“In view thereof the patent should not be given a broad or liberal construction.”

See also,

*Boston Woven Hose & Rubber Co. v. Penn.*

*Rubber Co.*, 164 Fed. 557; *C. C. A. 1st Cir.*;

*Lovell v. Seybold Mach. Co.*, 169 Fed. 288; *aff.*

159 Fed. 736;

*Kestner Evap. Co. v. American Evap. Co.*, 182 Fed. 844.

Judge Coxe, in *Severy Process Co. v. Harper & Bros.*, 113 Fed. 581 (at page 584), says:

“When, however, the question of infringement depends upon the construction of the claims, the court, in the endeavor to find out what it is that the inventor has given to the world, is justified in considering the invention as measured by the success achieved.” \* \* \*

“\* \* \* In such circumstances care should be taken not to reward the one *who is still wandering in the realms of theory at the expense of the man who has actually solved the problem.*” (Italics ours.)

Judge Sanborn, in *Stromberg Motor Devices Co. v. Parker*, 204 Fed. 462, says:

“Perkins’ invention has had no influence on, and never was used in, the automobile carbureter art. It should not rightfully be allowed to dominate that art, unless infringement is clear.”

As said by this court in *Kings County Raisin & Fruit Co. v. United States Cons. S. R. Co.*, 182 Fed. 59, at page 62:

“\* \* \* but it does not appear ever to have been put to use, and there is no evidence that any machine was ever constructed under it. It is one thing to invent the theory of a machine. It is quite another thing to invent a successfully operating machine.”

The proofs conclusively show that instead of the alleged Lyndon invention going into use and being “*epochal in its effect upon industrial and domestic lighting, heating and cooking*” no Lyndon electro-mechanical water wheel governor was ever constructed or used by anyone. The Lyndon invention did not teach anyone anything. From it the art gained nothing. Lyndon’s invention on the contrary existed only in the records of the Patent Office. It had no commercial existence. It was a mere paper conception. That it was dugged up by appellant *as a speculation* with the hope of having the court give the patent the most liberal interpretation and beneficent construction so as to lay tribute upon the successful governors produced by others without knowledge of the Lyndon paper conception and without such Lyndon theory having *in fact* any place or part in the art.

Frankness with the court would have compelled appellant to admit that the Lyndon invention and patent had no actual place in the art. That Lyndon's conception never went beyond paper. Under such circumstances appellant's statement that the Lyndon invention "*has been epochal*" must serve as a caution in considering each of appellant's contentions and representations in this case.

The inventor, Lamar Lyndon, admits that electric governors or electro-mechanical governors are not commercially used. [Xq. 483, Record page 2076, Vol. 6.] This fact is also of weight as Mr. Lyndon testifies that it is his opinion that *electro-mechanical* governors are superior to a purely mechanical form of governor.

The Lyndon device is far too complicated and the action of the electric devices comprising the Lyndon *electro-mechanical* governor are too uncertain to justify any engineer advising the installation of such a governor.

See particularly testimony of Edward S. Cobb, Record Vol. 2, page 594; Q. 59-60; Q. 61, page 595; Q. 617-630, Record, Vol. 3, pages 820-823; also pages 825-826, Q. 637-642; S. L. Berry, Record, Vol. 3, pages 913-915, Q. 34-35.

The proofs in the case conclusively show that the Lyndon patent discloses a mere theory,—a mere paper conception,—which never passed out from the realm of theory into the world of practical use and that from the alleged genius of Lamar Lyndon the world did not actually receive anything of value. He added nothing

to the useful art. The conception embodied in his patent has remained a mere dream,—although nearly eighteen years have passed since Mr. Lyndon applied for the patent.

The Lyndon device is inoperative.

If the device of the Lyndon patent will not operate *to govern the speed of a water wheel* in the manner and for the purpose set forth in the Lyndon patent, then it is a worthless device *and has no utility*. The defense of inoperativeness or want of utility is a distinct defense, not connected in any manner with or dependent upon any other defense. Section 4886, R. S. U. S., provides that:

“Any person who has invented or discovered any new and *useful* art \* \* \* may obtain a patent.”

Not only is novelty required but also *utility*. It is just as necessary for the inventor's conception to be useful for the intended purpose as it is that it shall be novel.

“UTILITY IS INDISPENSABLE TO A VALID PATENT. This is established by the language of the patent act (sec. 4886, R. S. U. S.), expressly limiting its benefits to arts, machines, etc., which are both new and useful. Novelty and utility, both, must concurrently exist, or the grant of the patent is a nullity.”

Hopkins on Patents, page 356.



“A patent is void for want of utility if its disclosure is inadequate to successful reduction to practice. This rule is indeed obvious.”

Hopkins on Patents, page 359, Sec. 298, Rule VII.

In *Mitchell v. Tilghman*, 86 U. S. 287, the court, at page 396, says:

“Inventions, in order that they may be the proper subjects of letters patent, must be new and useful. Utility in most cases is a question of fact, as it usually depends upon the evidence resulting from actual experiment. There are two modes, says Mr. Curtis, in which the utility of an invention may be impeached, the second of which is where it appears that *it is not capable of being used to effect the object proposed.*” (Italics ours.)

See also *Coupe v. Royer*, 155 U. S. 574, near bottom page 574, where it is said:

“A patented machine that will not do what it is intended to do could not sustain an action against one who was shown to use a successful and operative machine.”

Robinson on Patents, Vol. 1, section 338, page 462, says:

“In order that an invention may be patentable it must not only be bestowed upon the public by its inventor, but when bestowed it must confer them a benefit. The invention must therefore be useful as well as new. No recompense can properly be made to one from whom the community receives no consideration; and hence no patent can be granted for a worthless art or instrument,

nor, although granted, can it be sustained after the uselessness of the invention is established.”

“Section 339. UTILITY MEANS INDUSTRIAL VALUE. Utility, as predicated of inventions, means industrial value; the capability of being so applied in practical affairs as to prove advantageous in the ordinary pursuits of life, or add to the enjoyment of mankind.”

Walker on Patents (5th Ed.), page 97, sec. 77, says:

“The useful arts are those that Congress is authorized by the constitution to promote, and accordingly the statute includes utility among the qualities which a process or a thing must have in order to be patentable. To possess utility, a thing or a process must be capable of producing a result, and that result must be a good result. Both these elements inhere in the meaning of the word; and they are so distinct as to require separate explanation.”

“Section 78. Utility is absent from all processes and devices which cannot be used to perform their specified functions, and patents for such subjects are therefore void. This rule applies even to cases in which, by simply adding new elements to useless contrivances, highly useful inventions are produced.”

“In *Burrall v. Jewett* (2 Paige, 143), the patent covered the cylinder of a threshing machine, having rows of teeth inserted in its convex surface and revolving within a barrel which had no teeth. The contrivance was confessedly useless. After the patent for it was granted, the patentee, or some other person, by simply inserting rows of teeth in the concave surface of the barrel, produced the successful threshing machine, which has every-

where succeeded the ancient flail. The law applicable to these facts was stated by Chancellor Walworth in the following terms:

“The patent is void if the machine will not answer the purpose for which it was intended, without some addition, adjustment, or alteration, which the mechanic who is to construct it must introduce of his own invention, and which had not been invented or discovered by the patentee at the time his patent was issued.”

“In *Bliss v. Brooklyn* (10 Blatchf. 522), the patent covered a certain hose coupling. The contrivance was worthless because it proved on trial to be inoperative. The subsequent addition of a lug to one of its parts, transferred the coupling into a useful invention. Judge Benedict nevertheless held the patent to be invalid for want of utility.”

In *Besser v. Merrilat Culvert Core Co.*, 243 Fed. 611, at page 612, the Circuit Court of Appeals for the Eighth Circuit says:

“In other words, plaintiff’s invention is ‘new,’ but it is not ‘useful.’ The term ‘useful,’ as contained in the patent law, when applied to a machine, *means that the machine will accomplish the purpose practically when applied in industry.* It is to be given a practical and not a speculative meaning. *It means that the machine will work and accomplish the purposes set forth in the specifications.* Even if the machine can be made to accomplish the purposes specified, it is not useful, within the meaning of the patent law, if from its inherent nature it will accomplish the purpose only to such a restricted extent as to make its use in industry prohibitive. This has been the interpre-

tation put upon the term in the patent law from the earliest decisions to the present time. Bliss v. Brooklyn, Fed. Cas. No. 1,546; Chandler v. Ladd, Fed. Cas. No. 2,593; Troy Laundry Mach. Co., Limited, v. Columbia Manufacturing Co. (D. C.), 217 Fed. 787. These views are fatal to plaintiff's machine." (*Italics ours.*)

Lamar Lyndon testifies that the construction illustrated in the patent in suit is much cheaper than the other governors of the purely mechanical type. Yet he himself used the purely mechanical governors "which produced substantially the same results by different mechanical arrangements than those suggested by myself." [Record, Vol. 6, pages 2076-77, answer to Xq. 482.] Mr. Lyndon at the time designed the hydro-electric plant for the city of Lynchburg, *but he did not use his invention patented by the patent in suit.* He had also installed water wheels in Texas. We submit that it is highly significant that Mr. Lyndon, although working in this art, never made any use of his alleged invention.

It is possible for defendant to admit nearly everything complainant has said on the question of operativeness even including the *bald assertion that the Lyndon device is operative*, because complainant uses the word "operativeness" in a different sense than defendant.

When defendant asserts that the Lyndon alleged governor is inoperative, it does not mean that any of the features such as solenoids, circuits, magnets, contact points, will not perform the function of their design,



nor do we mean that any combination of such elements in the Lyndon device will not work, nor do we mean that the entire combination of elements will not cause the motions and make the connections that Mr. Lyndon describes. What we mean is that assuming that the movement of the solenoid core, contacts, etc., will take place substantially as described by Lyndon, the Lyndon device will not govern the speed of *a water wheel*, as described by Lyndon, in other words, that the results expected will not follow.

Our contention makes necessary a thorough understanding of the theory of Lyndon—*how he expects his mechanism to operate to govern the speed of a water wheel*.

The device of the Lyndon patent is a wholly inoperative and worthless piece of mechanism, as,

1. Lyndon clearly shows and describes a device, the purpose of which is to regulate the speed of the water wheel, *by maintaining a constant flow in the pipe line*.

See, specification of patent in suit, page 1, lines 8-35; page 4, lines 40-98.

Testimony of appellant's witness, C. L. Cory, Record, Vol. 1, pages 252-253, Q. 60-68.

Testimony of defendant's witness, Edward S. Cobb, Record, Vol. 2, pages 552-3, answer to Q. 5; Record, Vol. 3, pages 829-830, answers to Q. 649-650.

Testimony of defendant's witness, S. L. Berry, Record, Vol. 3, page 898, answer to Q. 5.

2. Lyndon attempts to maintain the flow in the pipe line constant by the use of a by-pass *normally held in half open position, through which water is being constantly wasted*, the purpose being to have a supply of water which may be thrown on the wheel, when owing to an opening movement of the main gate, the wheel momentarily slows down, and to have an outlet for water to compensate for an acceleration of the flow of water in the pipe line when the water gate is moved toward closing position.

See, specification of Lyndon patent in suit, page 1, lines 26-35; page 2, lines 58-65; page 4, lines 31-88.

3. It would seem that nothing could be more clear than that to accomplish the objects of Lyndon, *the valve in the by-pass should be half open, when not actuated for "governing."* It is distinctly so described throughout the Lyndon specification.

4. It is also very distinctly stated throughout the Lyndon specification that whenever the main gate moves either toward open or toward a closed position, *coincidentally* with such movement of the main gate, *the by-pass valve moves in an inverse direction.*

Specification of Lyndon patent in suit, page 1, lines 28 to 35; page 4, lines 40 to 49; page 4, lines 64 to 80.

5. In order that the movement of the main gate and by-pass may be inversely one to the other at all times, it is necessary to provide mechanism which will permit this coincident inverse movement, and Lyndon has clearly attempted to do so. That is to say, the mechanism which controls the by-pass is thrown into

operation at the same time that the mechanism causing movement of the main gate is caused to operate.

Specification of Lyndon patent in suit, page 2, lines 49 to 66; page 3, lines 75 to 88; page 4, lines 16 to 35.

6. Mr. Henry, the complainant, should have been able to explain the operation of the Lyndon patent when he offered himself as a witness in this case. There could be no reason for testifying positively to a certain operation, and thereafter absolutely contradicting himself.

Mr. Henry first takes the position that contacts 40-40a (or 41-41a) are made *at the same time* as contacts 45-45a; 46-46a; 103-100; 104-101; which is manifestly true because in order for coincident operation of the by-pass valve with the main gate, the by-pass valve mechanism *must* be set in operation at the same time.

See first Mr. Henry's testimony given Jan. 15, 1914, Record, Vol. 1, page 120, ans. to Q. 57; pages 114-115, answers to Qs. 33-40.

In this connection also see, specification of Lyndon patent, page 1, commencing with line 30.

Appellant's witness, C. L. Cory, also first testifies that energization of the magnet controlling the by-pass will be coincident with the energization of the magnets controlling the water gate. [Record, Vol. 1, page 234, sentence commencing in 5th line from bottom of page.]

The device of the patent in suit is inoperative if constructed according to Lyndon's description and drawing, and if operated in accordance with Lyndon's theory of operation:

(1) Lyndon has not disclosed operative means for accomplishing the result desired, because,

(a) If contacts are made at 40-40a; 45-45a; 46-46a; 103-100; 104-101 at the same time *the returning device will be thrown into operation causing the breaking of contacts at 40-40a before governing has been effected*, because,

(a-a) It is to be noted that the movement of rod 25-25a is very slight—not a full quarter of a turn of the shaft 12.

See line 133, page 3, Lyndon specification, *et seq.*:

“\* \* \* which causes engagement of disks 23 22 and causes the disk 22 to be carried *slightly around* one way or the other, \* \* \* thereby returning the lever 26 to normal position.”

(b) Rod 25 cannot be safely adjusted to break contact only after moving a full quarter of a turn, because if for any reason (owing to a more than usual energization of solenoid 33) contact at 40-40a is not broken immediately upon rod 25a being pushed to the limit of its range of movement (not to exceed a quarter of a turn of shaft 12) rod 25a will be carried around the shaft and it will be pulled in a direction opposite to what is desired.

(c) It should also be noted that the hub of disk 22 is much larger in diameter than shaft 12. This multiplies the distance to which rod 25a may be pushed by the thrust caused by the revolution of shaft 12, so that an extremely slight movement of shaft 12 might be sufficient (and it is plainly contemplated by



the patentee, as evidenced by the statement that disk 22 is carried *slightly around*) to break contact at 40-40a.

(d) The maximum movement of shaft 12 before contact is broken cannot be over a quarter of a turn.

(e) Shaft 12 is a faster moving shaft than shaft 20 and consequently both by-pass valve and main gate *will only commence to move before being thrown out.*

(f) *The so-called returning device of the patent in suit is not dependent in its operation upon the needs of good governing, but operates arbitrarily upon a slight movement of the shaft 12 without regard to whether proper regulation would require a wide opening of the main gate and by-pass or only a slight opening of such main gate and by-pass.*

(g) Appellant's witness, C. L. Cory, *admits* that the Lyndon device would not be operative if contacts were made at the same time.

See Record, Vol. 2, page 502, answer to Q. 439.

(h) Henry admits that there is no statement in the Lyndon patent, to the effect that Mr. Lyndon had in mind any adjustment which would permit movement of the main gate without any corresponding movement of the by-pass valve.

See Record, Vol. 1, pages 348-349, answer to Q. 298.

(i) Defendant's witness, S. L. Berry, testifies:

"The mechanism as shown is inoperative and especially inoperative in the return mechanism. This return mechanism comes into action simultaneously

with the gate-operating mechanism. There is no time allowed for gate movement, nor any action depending on gate movement. The mechanism shows the return device to be of exceeding quickness in action. There is no rest between the application of the gate-moving device and the operation of the return mechanism. Furthermore, on the operation of this return mechanism the clutch throwing it into action is disconnected, leaving the solenoid 33 free to make the same connection previously made, the result being a vibration of the lever 40 between contact and non-contact. I can see no element properly correlating the action of the return mechanism with the gate movement.” [Record, Vol. 3, page 900.]

“Q. 32. Referring to the springs shown at 29 29 and 27 28 in the drawing of Complainant’s Exhibit C and in the Lyndon patent, I will ask you to state what you understand to be the function of those springs, how they aid, if at all, in the operation of the device that is shown in the Lyndon patent.

A. The springs 29 29 placed between collars 29a 29a and working from fixed part 30, the returning-mechanism consisting of rod 25, link 25a, clutch 22, the springs 27 and 28, placed between collars 27a and 28a, and working against control-lever 26, are inserted to permit clutch 22 to operate the return-mechanism and controls lever 26, at the same time permitting controlling-lever 26 to operate from solenoid 33 without interference from the returning mechanism. Fundamentally, these springs are not required in the mechanism inasmuch as clutch 22 can be put in opera-

tion by clutch 23 at any point in the circumference. The movement of clutch 22 cannot much exceed the range of control-lever 26. As far as the operation is concerned, the effect would be the same with the return-mechanism directly connected to the control-lever 26. As shown on the drawing, springs 27 28 disturb the function of spring 38, working against the pull of the solenoid core 34. The solenoid core 34 to be stable must have a range responsive to various speeds of the generator 8. At the neutral position of control-lever 26 the spring system 27 28, 29 29, is balanced exerting no pressure on control lever 26. In this position the pull on the solenoid core 34 is balanced by the tension of spring 38 modified by the action of spring 37 which, in itself, has no true function, its use serving simply to modify the portions of spring 38, the balance in this solenoid mechanism necessarily being between the pull on the core on the one hand and the extension of spring 38 on the other. When the control-lever 26 is moved from its neutral position by the core 34 it encounters a positive resistance in either direction, the result being that this positive resistance is added to an increasing spring tension in spring 38 in one direction, and added to a decreasing tension in spring 38 in the other, the result being a different action of one side and the other, due to changes in speed of the generator 8." [Record, Vol. 3, pages 912-913.]

"Q. 141. You have mentioned in your previous testimony the operation of the returning device, not stating the reasons for your opinion as to the impracticability of the device shown and described in the Lyndon pat-

ent in suit. Please state more fully your reasons for the opinion expressed at that time.

A. Referring to Complainant's Exhibit C representing in a clearer manner the parts shown in figure 1 of the Lyndon patent No. 695220, we find this returning device to consist of a clutch part 23 free to move endwise on the shaft 12, but constrained to rotate therewith, the clutch part 22 freely mounted on shaft 12, and having connected to it by bolt or pin a connecting rod 25a, which is attached to the return rod 25, having thereon the springs 29 29, held between collars 29a 29a, a bearing on fixed frame portion 30, and springs 27 28, held between collars 27a 28a, and bearing on either side of the control-lever 26. This clutch is thrown into action through the lever 24 fulcrumed at 24a, engaging on one of its ends through a fork the clutch member 23, and having on its other end an armature 31 which is attracted to the electromagnet 32 on the passage of current therethrough. The current required to energize the said electromagnet 32 is supplied by the generator 8, on the making of a connection at contact points 45 45a, 46 46a, in the circuit 102 98 99. The contacts 45a 46a placed opposite to the contact 45 and 46, are mounted on the lever 43 fulcrumed at 43a, provided with a curved slot 44, having therein a pin or roller 44a attached to the bell-crank 42, which is fulcrumed at 42a to a fixed frame member and connected at its third end to a rod not marked in this exhibit but marked 36 in figure 1 of the Lyndon patent. Said rod 36 is connected to the rod 35, forming a portion of a core 34, acting within and influenced



by the solenoid 33. The action of this core 34 is resisted primarily by the spring 38, modified by the action of springs 37 27 28 29 29. Solenoid 33 is energized at all times during the operation of the plant by means of a current furnished by the generator 8 through a circuit marked in this exhibit 35a, and in figure 1 of the Lyndon patent 33a. The arrangement of these parts is such that at the normal operating speed the current furnished by the generator 8 to energize solenoid 33 sufficiently to attract core 34 by an amount equal to the tension in the spring 38 modified as before mentioned. On increase of speed the pull on core 34 is increased, resulting in a movement of the core 34 within the solenoid, making a contact at 40 40a, and through the mechanism before described at 45 45a, 46 46a, 103 100, 104 101. As shown in the drawings and described in the specifications, the contacts on the lever 43 are made simultaneously with those on the lever 26. As electric action is extremely rapid this will produce simultaneous action at the electromagnets 15 and 32. Examining the relation of the part furnishing motion to the clutch member 23, we find it to be the water-gate-operating shaft 12 set in action by the reversing clutch-gear shown at 9, 10, 11 and 13, deriving power from the driving shaft 6. The movement required on the part of the clutch member 22 to throw open the contacts at 40 located on lever 26 is very small, being a small part of one revolution. The water-gate-operating shaft 12 as shown is a high speed member operating much more rapidly than the succeeding portions of the device con-

necting it to the water-gates. In consequence of the various relations mentioned, and especially the simultaneous action of contact and the small movement required in that part of the clutch member 22, the control-lever 26 will be acted upon within an exceedingly short time after gate-operating shaft 12 starts to move, and as a consequence of this, the contacts at 40 40a are open, the electromagnet 15 is deenergized, the lever 14 is returned to central position by means of its balancing springs, the action of the clutch 13 ceases, preventing further motion of the water-gate-operating shaft 12. Furthermore, the disconnection of these parts and return of the control-lever 26 to its neutral position, leaves said control-lever free to respond to the action on the part of the solenoid 33 and its core 34. This freedom permits the core 34 to immediately reengage contact 40 unless within this exceedingly short interval of time the generator 8 has returned to its normal speed, at which point the control-lever 26 is balanced in its neutral position. Following this reengagement at contacts 40 40a, the cycle of operations before described reoccur and will continue, disengaging and engaging the control-lever 26 and the clutch 23 22 in an exceedingly rapid manner. The means shown provide no parts by which these movements can be constrained and controlled in order to permit the water-gates to be operated to the amount required. In other words, the operation of the returning mechanism is dependent solely on the speed variation of the dynamo 8, and has exceedingly small relation with the movement of the water-gate-operating parts.

Q. 142. By Mr. Westall: Suppose you were to construct a device substantially in accordance with the drawings of the Lyndon patent in suit, and were to set that device in operation by permitting water to flow through the main pipe-line. Please state how you would expect the device to operate.

Mr. Blakeslee: We object to this question as necessarily indefinite. The word "substantially" is very elastic, and we wish to know, before we permit this question to be answered without objection, whether the answer means a construction in accordance with the drawings or one subject to alterations under the control of mental reservations of one sort or another.

Mr. Westall: By "substantially" is meant in such manner as one skilled in the art with the Lyndon patent before him, and who had been requested to build a device in accordance with the specifications and drawings of the Lyndon patent, would build such device. There are always, of course, minor changes in the actual construction of a device. But by "substantially" I mean approximately "exactly."

Mr. Blakeslee: The further objection is made that the question does not call for the best evidence but for a mere question of opinion. We are charging infringement of this patent by the embodiment of the invention in certain apparatus. That is open to discussion and has been discussed in this case. If the defendant wishes to produce any other construction alleged to embody the invention of this patent and following more or less specifically the exact line and word disclosures of this patent, let it do so. And let the evidence be adduced

to show how the same operates. The patent is presumed to be operative and speaks for itself, unless evidence can be adduced contrary to the general purport of the patent.

A. In view of extremely rapid action described in my last answer of the returning device, and the relatively slow movement of both the water-gate parts and the by-pass parts, and the weight and size of these latter parts, I would expect in a mechanism constructed in accordance with the Lyndon patent specifications to find a rapid intermittent attempt on the part of the contact-making devices to operate the said gate and by-pass parts, and an equally rapid attempt on the part of the returning device to prevent such action. In view of these conditions, the gate and by-pass parts, if they move at all, would do so by an exceedingly small amount during each cycle, especially in the case of the butterfly by-pass valve, which in most plants would be large and heavy, and subject to a great difference of pressure on its two sides, which difference in pressure would vary rapidly with any displacement from its normal position. There is in a valve of this nature the necessity of considerable exertion of power and the lapse of a certain amount of time to produce movement, which, taken in connection with the lost motion throughout the mechanism, would tend to the result predicted." [Record, Vol. 3, pages 1002-1007.]

(j) *We have the tacit admission of complainant that the Lyndon device would be inoperative if the contacts were made coincidentally in a flat contradiction of his first testimony. Two days after having testified that*



*contacts were coincident* [Record, Vol. 1, page 115, ans. to Q. 38], *Henry testifies* [Record, Vol. 1, pages 212-215] *that these contacts are made in sequence as distinguished from coincident.*

(J) To provide for any sequence energization of the various magnets as suggested by Mr. Henry would require a *departure from the principles of the Lyndon patent*, because,

(1) Such a reinvention of the Lyndon patent would permit a movement of the main gate without a movement of the by-pass valve. This would be in derogation of the showing in the drawings and of the description.

(2) There is no suggestion in the Lyndon patent that any sequence of energization was desirable.

(3) The substitution of mercury contacts would not render the Lyndon device operative.

See testimony of defendant's witness, S. L. Berry, Record, Vol. 3, pages 1007-1012. In answer to Q. 147, page 1009, Mr. Berry says:

"The substitution of mercury contacts for those shown in the patent at 45 45a, 46 46a, 103 100, 104 101, would not, in my opinion, render the mechanism operative, even for the sequence of action aimed at."

See further Mr. Berry's answer to Q. 148.

(K) Complainant's only answer to defendant's contention that the Lyndon device is inoperative is the production of a model which ignores the question completely, because,

(1) "Complainant's exhibit Lyndon model" is not constructed in accordance with the Lyndon patent:

- (a) It is not a water wheel governor.
- (b) It does not operate as a water wheel governor.
- (c) It shows absolutely nothing that defendant has not already tacitly admitted.

We call the court's particular attention to the testimony, in sur-rebuttal, of defendant's witness, Prof. William F. Durand, who is professor of mechanical engineering at Stanford University. Prof. Durand analyzes the Lyndon patent in and points out the failure of the model to prove anything in reference to the operativeness or inoperativeness of the Lyndon theory. Prof. Durand's testimony is printed in Volume 7 of the Record, commencing on page 2741. In answer to question 23, Prof. Durand says (referring to the model, "Complainant's patent model"):

"The mechanism could not be considered as a proper operating model representing the disclosures of the Lyndon specification, without it contained all of the essential elements of operation which are implied in such specification. I find certain elements lacking in this model which are essential to the operation of a complete hydraulic power plant unit combined with a governing device such as is implied in the Lyndon specification. \* \* \*" [Record, page 2767.]

Prof. Durand's testimony utterly destroys the probative effect of this model. A reading of his testimony will demonstrate the misleading character of this exhibit. Prof. Durand sums up his reasons on re-direct, see Record, pages 2864-2869.

The District Court found that:

“The evidence shows, unquestionably, that the Lyndon invention will not work if the mercury cups are used as disclosed in the patent without change.” [Record, Vol. 1, page 67.]

“There never has been a machine manufactured like that described in this patent.” [Record, Vol. 1, p. 67.]

The opinion of the District Court conclusively shows the broad and expanded interpretation asserted by appellant for the claims of the patent in suit. In the District Court the appellant contended that “it is not necessary to resort to the doctrine of equivalents in order to determine this infringement.” [Record, Vol. 1, page 62.] Appellant’s contentions ignore the plain rule of patent law, repeatedly applied by the Supreme Court and by this court, that where two devices operate upon different principles and under different modes of operation one cannot infringe the other.

Westinghouse v. Boyden Power Brake Co., 170  
U. S. 537;

Cimiotti Unhairing Co. v. American Fur Ref.  
Co., 198 U. S. 399;

Stebler v. Porterville Citrus Ass’n., 248 Fed.  
927, 930.

As said by Your Honors in the latter case:

“While the same result is accomplished in the defendant’s machine as in the complainant’s, there appears to be such a variation of means as to avoid infringement in the features complained of.”

The appellant's contention in the District Court "that the word means is so broad in its scope that it embraces any mechanism that will accomplish the result claimed for his patent" [Record, Vol. 1, page 63], was not only a direct admission that the devices of defendant vary more than merely colorably from the devices or elements of the Lyndon patent but also a bald misstatement of the law. As said by Walker on Patents (5th Ed.), Sec. 341, page 425:

"\* \* \* but if the mode of operation is substantially the same, it does not follow that the charge of infringement must be affirmed."

Field v. DeComeau, 116 U. S. 187;

Yale Lock Co. v. Sargent, 117 U. S. 378;

Diamond Drill Co. v. Kelly Bros., 120 Fed. 293.

As said by Circuit Judge Hough, in Linde Air Products Co. v. Morse Dry Dock & Repair Co., 246 Fed. 834 (C. C. A. 2nd Cir.):

"There is no magic in a name, nor in a claim; that the words preferred by a patentee to define his invention apply literally to another's device *suggests, but does not prove*, infringement; there must be a substantial identity, to justify that conclusion of law. Edison v. American Co., 151 Fed. 787, 81 C. C. A. 391." (Italics ours.)

Notwithstanding the breadth of the word "means" it cannot be all embracing. As said by Mr. Justice Holmes, in Towne v. Eisner, 38 Sup. Ct. Rep. 158 (Oct. 1917 Term):

"A word is not a crystal, transparent and unchanged, it is the skin of a living thought and may vary greatly in color and content according



to the circumstances and the time in which it is used. *Lamar v. United States*, 240 U. S. 60, 65."

It is clear that a defendant's device must be a literal copy of the device as shown in the patent in suit, or, in order to infringe, must be the mechanical equivalent. The District Court properly determined the error of appellant's contention.

While it is the general rule that the grant of a patent is *prima facie* evidence of its validity, such presumption is recognized as a very slight presumption. In the case at bar the presumption is not fortified by any evidence (such as is usually before the court in patent cases involving meritorious patents), that the device of the patent has gone into use; has had an actual place in the art; has in fact proven of value to the public. On the contrary no Lyndon *electro-mechanical* governor was ever made or ever used. It is well recognized that this presumption of validity is weakened by a showing that the examiners of the patent office overlooked material parts of the prior art when considering the application for patent.

In the present suit the presumption of validity is substantially lacking:

(A) There are many mistakes and errors in the Lyndon patent specification and drawing which could not have been allowed to pass uncorrected by the examiner in charge of the examination of the Lyndon application had said examiner thoroughly understood the device.

See the testimony of defendant witness, S. L. Berry, Record, Vol. 3, pages 909-911, answers to Q. 28-29. (This testimony also points out that "Complainant's Exhibit C" is not a copy of Fig. 1 of the Lyndon patent but on the contrary shows a modification of Fig. 1 of the patent. See Mr. Berry's testimony in answer to Q. 28-32, Record, pages 909-913.)

(B) Several important patents which have the effect of limiting the Lyndon claims, or warranting their disallowance on the part of the Patent Office Examiner, were not discovered by the Patent Office and were not cited on the patent application, because,

(1) French patent #291,588, granted August 8, 1898, to Escher Wyss & Co.—over a year before the application for the Lyndon patent in suit (Sept. 13, 1900) was overlooked by the examiner and not cited.

(2) Foreign patents are sufficiently proven.

R. 454 (offered 456, line 18);

R. 1389 to R. 1391, section 893 R. S. U. S.;

Schroerke v. Swift Cortney & Beecher Co., 7 Fed. 469;

Barber v. Mexico National, No. 73 Conn. 587,  
48 Atl. 758.

(3) Said French patent reads literally on some of the claims of the Lyndon patent in suit.

R. 530, line 8, to R. 532, line 6—(Cobb);

R. 827, line 17, to R. 830, line 21—(Berry).

(4) Swiss patent No. 17,536 granted Dec. 15, 1898, to Irene Shaad (granted nearly two years prior to the

Lyndon application—(Sept. 1900)—was overlooked by patent examiner and not cited.

(5) The claims of Lyndon patent in suit read literally on said Swiss patent.

See, testimony of appellee's expert, Cobb. Record, Vol. 2, pages 639-641, Q. 96-98; testimony of appellee's expert, Berry, Record, Vol. 3, pages 953-956, Q. 62-63.

Hopkins on Patents, Vol. 1, page 28, section 13:

"Where the history of the application for a patent shows that the Patent Office did not refer to and consider the references which are urged against the validity of the patent in litigation, *the court must determine the weight and effect to be given such references, as a matter of first impression, and the failure of the Patent Office to cite such references may wipe out the ordinary presumption of validity attendant upon the grant.*"  
(Italics ours.)

See,

William B. Scaife & Sons Co. v. Fall City Woolen Mills, 194 Fed. 139, last paragraph, page 145;

Westinghouse Electric & Mfg. Co. v. Toledo P. C. and L. Ry. Co., 172 Fed. 392-393 (last paragraph page 392);

American Soda Fountain Co. v. Sample, 130 Fed. 149 (last paragraph page 149).

C. The patent was granted without thorough examination:

Imperial Valley Cap etc. Co. v. Crown Cork etc. Co., 139 Fed. 312, reversing 123 Fed. 669.

### Electro-Mechanical.

Defendant does not infringe any of the claims of the patent in suit, because:

A. Lyndon must be limited to *a special form of water wheel governor*, namely: an *electro-mechanical water wheel governor*, because,

(1) He has limited himself to an electro-mechanical water wheel governor, because,

(a) He has used the term “electro-mechanical” in his short descriptive title in compliance with section 4884 R. S. U. S.: “Every patent shall contain a short title or description of the invention or discovery correctly indicating its nature and design, \* \* \*.”

(b) Lyndon has distinctly stated in the body of his specification that he has “invented certain new and useful improvements in electro-mechanical water wheel governors, of which the following is a specification.”

(c) Lyndon illustrates and describes solely a combination of electric and mechanical means, most appropriately described as “electro-mechanical” designed as a water wheel governor.

(d) Lyndon has not described or shown a purely electric or purely mechanical water wheel governor.

(e) His claims must be read as covering a combination of elements forming a part of an “electro-mechanical” water wheel governor, because:

(a-a) Section 4888 R. S. U. S. provides that before any inventor shall receive a patent he shall make application therefor, and shall file a written description of his invention, *and he shall particularly claim THE*



PART, improvement, or combination which he claims as his invention or discovery. Part of what? *Part of what he has invented.* What has he invented? He distinctly tells us in his specification, *an electro-mechanical governor.*

(f) It is fair to presume that he so limited himself to a special form of water wheel governor, namely: an “electro-mechanical water wheel governor,” because:

(a-a) It was necessary for him to so limit himself in view of the prior art, because:

(1) Both electric water wheel governors and mechanical governors were old.

(2) A patent is a contract between the state and the patentee, and is to be interpreted by the same rules as any other contract:

National Hollow Brake Beam Co. v. Interchangeable Brake Beam Co., 106 Fed. 693, Circuit Court Appeals, 8th Circuit, last paragraph on page 701, as follows:

“A patent is a contract by which the government secures to the patentee the exclusive right to vend and use his invention for a few years, in consideration of the fact that he has perfected and described it and has granted its use to the public forever after. *The general rules for the interpretation of grants and contracts govern its construction*, and the equitable principle that one who has derived great benefit from the performance of a contract ought not be allowed to escape its burden without cogent reason is not inapplicable in its exposition. Among the primary rules for the construction of a contract are these: the court should

put itself in the place of the parties at the time it is made, and should read its terms in the light of the facts and circumstances which then surrounded them. When the intention of the parties is manifest, it should control, regardless of inapt expressions and technical rules.”

Century Electric Co. v. Westinghouse Electric & Mfg. Co., 191 Fed. 350, 354, p. 354.

(3) The general rule for interpretation of contracts that the intention of the parties should prevail is applicable, because:

Bishop on Contracts (second enlarged edition), page 155, section 380:

“The rule most conspicuous and far reaching is, that a written contract shall be so interpreted as, if possible, to carry out what the parties meant. This is likewise the foremost rule from interpretation of statutes, namely: so to render them as to give effect to the legislative intent. Section 381. The parties are bound by the terms which they have voluntarily employed, and since they cannot plead ignorance of the law, neither likewise can they of the effect of their language. Within this rule, a stipulation for a thing will not be satisfied by something else presumably as good, as, if a railroad by its ticket promises a ride from Portland to Boston it cannot be compelled to furnish one from Boston to Portland, and if an insurance policy declares that certain answers shall constitute a part of the contract and be a warranty, the insured person cannot avoid their effect by showing their immateriality.”

(a) The intention of the government in calling the device and the issuing a patent for—not simply a “water wheel governor” but in calling it “an *electro-mechanical* water wheel governor” is clear.

(b) The intention of the patentee in expressly stating that an “*electro-mechanical* water wheel governor” was what he invented cannot be mistaken.

Beale Cardinal Rules of Legal Interpretation.

(4) The cardinal rule that effect should be given to every part of a contract is applicable, because:

Beach on Contracts, Vol. 1, Sec. 73, says:

*“The cardinal rule in the interpretation of contracts is to give effect to every part of them if practicable.”*

Bishop on Contracts (second enlarged edition), page 158, Sec. 384, says:

*“Every clause and every word should, when possible, have assigned to it some meaning. It is not allowable to presume, or to concede, when avoidable, that parties in a solemn transaction have employed language idly.”* (Citing many cases.)

(a) The court cannot find infringement *without totally disregarding and ignoring the word “electro-mechanical”* in the title and statement of the Lyndon specification.

(5) The proper attitude for the court should be to *interpret the contract in favor of the government, rather than in favor of a private suitor; in limitation of the monopoly rather than in expansion of it.*

Bishop on Contracts (second enlarged edition), page 170, Sec. 415, says:

“Where the state with us, or in England the crown is a party on one side and a subject is a party on the other, the entire contract is to be construed more strongly against the subject.”

Bishop on Contracts (second enlarged edition), page 417, Sec. 390, says:

“In general, government contracts are interpreted by the same rules as those of individuals, but in early times there were a few differences, not all of which have become obliterated. *As already seen, a difference which remains is, that the government contract is construed more strongly against the private party; the rule of the old law being that ‘if the right lie equal between the king and subject the king’s title hath the preference*  
\* \* \*

#### Section 991:

“The common law prefers the king to the private creditor in respect of debts due to both; so that if the debtor cannot pay all, the crown has the first claim upon his property. *This principle has been adopted by Congress in its legislation, and it is constantly acted upon by the courts of the United States. In probably most of our states it is accepted as part of their unwritten law.*”

#### Citing:

U. S. v. State Bank, 6 Peters 29-34;

U. S. v. Hack, 8 Peters 271;

Thelusson v. Smith, 2 Wheat. 396;

Harrison v. Sterry, 5 Cranch 289;



U. S. v. King, Wall. C. C. 113;

U. S. v. Heaton, 128 Fed. 414.

(6) Lyndon's conduct in not suing upon his patent for a lapse of over eleven years raises the presumption that he did not believe the structure now complained of infringed.

Bishop on Contracts (second enlarged edition), page 168, Sec. 412:

*"In case of doubt, the interpretation which the parties by their acts under their contract have practically given it, will have weight, and it may be controlling."*

B. Defendant does not use an electro-mechanical water wheel governor.

See, for example, the testimony of defendant's expert, S. L. Berry, Record, Vol. 3, page 1055:

"The term 'electromechanical' used in the title of the Lyndon patent in suit No. 695220 and in the first paragraph of the specifications, describes the device as shown in the drawings and specifically explained in the specifications, inasmuch as the controlling elements are electrical and the gate-operating parts are mechanical in their nature. Such word, however, does not describe the devices shown in complainant's exhibits mentioned, inasmuch as there is no electric feature involved, the means being strictly mechanical as to the speed-sensitive parts and mechanical and hydraulic as to the other operating parts."

### What Constitutes Infringement.

It is elementary patent law that in order to infringe not only must the defendant's device perform the same function as that of the device of the patent, but it must perform that function in substantially the same manner. Difference in principle or mode of operation negatives infringement,—even of the most pioneer or “basic” invention.

Westinghouse v. Boyden Power Brake Co., 170

U. S. 537;

Cimiotti Unhairing Co. v. American Fur Ref.

Co., 198 U. S. 399;

Walker on Pats. (5th Ed.), Sec. 341, page 425.

But not only must the mode of operation or principle of the device, as a whole,—as a machine,—be substantially the same as that of the patented invention, but the mode of operation of each of the constituent parts or elements and their interrelation be substantially the same, and each must perform in the device substantially the same function and in substantially the same manner, as the device for which is to be found the equivalent in the patented machine.

Riverside Hts. O. G. Ass'n v. Stebler, 240 Fed.

703 (C. C. A. 9th Cir.);

Hopkins on Pats., Vol. 1, Sec. 38, page 39;

Walker on Pats., Sec. 340;

O'Reilly v. Morse, 56 U. S. 63, pages 112-113;

Steam Gage and Latern Co. v. St. Louis Ry.

Supp. Mfg. Co., 29 Fed. 447;

Werner v. King, 96 U. S. 218;

Engle Sanitary & Cremation Co. v. City of Ellwood, 73 Fed. 484;

Reis v. Barth Mfg. Co., 136 Fed. 850, last par. p. 853;

Diamond Match Co. v. Ruby Match Co., 127 Fed. 341.

In Severy Process Co. v. Harper Bros., 113 Fed. 581, 584, Judge Coxe says:

“Claims of a patent should not be so broadened by construction as to include devices which, though accomplishing the same function, do so by new combinations, operating upon principles so different as to entitle their originator to be considered as an independent inventor.”

### Difference in Result.

The Lyndon patent describes and claims a device in which *there is a constant and excessive waste of water.*

See, specification of patent in suit, page 1, lines 26-35:

“Normally the gate or valve in the by-pass will be halfway open, so that the amount of water flowing through the by-pass and around the wheel without doing work will be half the amount which the by-pass is capable of carrying.”

Lyndon specification, page 4, lines 35-40.

“After the governing takes place the by-pass gate is either open or closed, or nearly so, *and in order to be useful for a second governing must return to its normal position.*”

Lyndon specification, page 4, lines 80-84.

See testimony of S. L. Berry, Record, Vol. 3, page 1024, answer to Q. 162; pages 1195-1198, ans. Q. 591-602.

As said by Mr. S. L. Berry:

“In a majority of plants installed for the generation of power from water the question of water economy is of vital importance.” [Record, Vol. 3, page 1021.]

Such economy of water cannot be secured and use the theory of the Lyndon invention.

“When the main water-gate of the wheel disclosed in the Lyndon patent is closed, the by-pass valve is in half-open position, thereby wasting a quantity of water equal to one-half the full capacity of the by-pass.” [Record, Vol. 3, page 1023.]

“In cases wherein economy of water is a factor, or a desirable feature, I would not consider the device” (of the Lyndon patent in suit) “as practical commercially, inasmuch as attainment of the objects set forth would prevent such economy of water.” [Record, Vol. 3, page 1022.]

No adjustment of the by-pass valve, of the Lyndon patent, to occupy any position other than half open position as the normal position of such valve could be made without departing from the essential principle of the Lyndon invention.

See testimony S. L. Berry, Record, Vol. 3, pages 1012-1018; Vol. 4, pages 1445-1447, ans. to Q. 1409-1410; Prof. Durand, Record, Vol. 7, pages 2763-2766, answers to Q. 19-20.



If the principle upon which the Lyndon invention is founded, then, is a normally half-open by-pass valve (with its accompanying waste of water), it is elementary that claims which include such by-pass and by-pass valve cannot be so construed as to ignore such principle of operation; such claims are limited by the mode of operation of the devices shown in the patent drawings and described in the specification and cannot be so interpreted as to disregard the principles of the drawings and description. Inasmuch as the entire theory of the Lyndon patent is builded upon a normally half-open by-pass valve which may be moved from such half-open position to closed or to fully open position as required coincident with the reverse opening or closing of the main water gate, no device which does not utilize such underlying principle can embody the Lyndon invention. The claims of a patent cannot cover that which is not illustrated or described in the drawings or specification.

Electric Storage Battery Co. v. Gould Storage Battery Co., 158 Fed. 610, 616;

Valvona-Marchinoy Co. v. Perella, 212 Fed. 168;

Siemund v. Enderlin, 212 Fed. 410;

Gunn v. Bridgeport Brass Co., 148 Fed. 239;

Locke Insulator Mfg. Co. v. Ley, 143 Fed. 911;

Bates Machine Co. v. William A. Force & Co., 149 Fed. 220;

American Sewage Disposal Co. v. Pawtucket, 132 Fed. 35.

In *Wicke v. Ostrum* (103 U. S. 461), the court had before it the *Wicke* pioneer patent for machines for nailing boxes. With the machine of this patent the nails were driven vertically. With such a machine the nails must necessarily be held in place by some mechanical means until they were guided to and fastened in the board. The defendant conceived the idea of driving nails horizontally instead of vertically, and made a machine for that purpose. In such machine the nails would lie in a groove and be held there by gravity until forced into the board. The court says:

“As has already been seen, Wicke made an upright machine. For such a machine the combination of all his several elements was necessary. If any one, or its mechanical equivalent, was left out, an upright machine like this could not be operated successfully. A combination of other elements, not the equivalents of his would be a different machine and, consequently, not an infringement. From the evidence, it is clear he was the first to put into practical use the idea of driving more than one nail at the same time in the manufacture of boxes by the use of machinery. The idea he could not patent, but his contrivance to make it practically useful he could. By his patent he appropriated to himself only so much of the field of invention which his idea embraced, as the machine described and claimed in his specification covered.”

While Lyndon's conception of an electro-mechanical water wheel governor depended upon such a half-open by-pass valve and its consequent water waste, defendant's mechanical (not electro-mechanical) governor

does not utilize such principle. Defendant's governor economizes water. In defendant's device the auxiliary relief nozzle is normally closed or nearly so.

See testimony, complainant's witness, C. A. Heinze, Record, Vol. 1, pages 181-183, ans. Q. 12-27; complainant, G. J. Henry, Jr., Record, Vol. 1, pages 349-350, answer to Q. 299; pages 381-382, answer to Q. 368; S. L. Berry, Vol. 3, pages 1037-1040, answers to Q. 173-177.

In defendant's device the auxiliary relief nozzle only opens and permits the escape of water *to relieve excessive pressure* to which the pipe line may be subjected on rare occasions.

See testimony of complainant's witness Scattergood, Record, Vol. 1, page 161, ans. to Q. 20-44; pages 175-178, ans. to Q. 59-65.

*The devices of defendant differ from that of patent in suit in broad principles of operation and design:*

(1) Lyndon seeks by his by-pass to govern the wheel by *maintaining a constant flow of water in the pipe line.*

(2) With Lyndon, the by-pass is an important means of overcoming inertia effects of the water *which interfere with the proper speed of the water wheel—under Lyndon's theory the half-open by-pass is an indispensable means for governing the speed of the water wheel.*

(3) In defendant's device governing is *mainly accomplished by the main needle.*

(4) In defendant's device the auxiliary nozzle is used as a *safety valve* to prevent the damaging effects to the pipe line of excessive pressure which occur on extraordinary occasions—the main needle moves many times to govern the water wheel without causing a movement of the auxiliary relief nozzle. (See testimony of S. L. Berry, Record, Vol. 3, pages 1079-1082, answer to Q. 215.)

(5) Lyndon, in the patent in suit, clearly describes a device in which the by-pass valve is operated *inversely* to the operation of the water gate in *both* directions.

See testimony of S. L. Berry, Record, Vol. 3, pages 1155-1157, answers to Q. 443-448; page 1176, answer to Q. 525-530.

(6) The claims in suit cannot properly be construed to indicate a choice of directions. Hence complainant's expert, Prof. Cory, impliedly admits that defendant does not infringe.

Record, Vol. 2, pages 424-428, answers to Q. 208-216; see also testimony of S. L. Berry, Record, Vol. 3, pages 1180-1183, ans. to Q. 541-546.

(7) In defendant's device the auxiliary relief nozzle (attempted to be read as a by-pass valve by complainant) occupying a closed position, or a nearly closed position, *cannot have a movement inverse to that of the main nozzle in both directions at all times*. On the contrary, when such auxiliary nozzle is closed a further opening of the main needle can have no effect on the auxiliary needle nozzle and the normal position of defendant's auxiliary nozzle is closed,—not half-



way open for operation towards closed or towards open position *inversely* to the movement of the main gate.

In the Lyndon device the *means for accomplishing results are mainly electrical and cannot be described as substantially the same means as the purely mechanical means used by defendant*. Appellant's expert, Prof. Cory, admits there is no true equivalence. See Record, Vol. 2, pages 443-444, answers to Q. 262-264.

Walker on Patents (5th ed.), page 424, Sec. 340:

"\* \* \* *Any person may accomplish the result performed by a patented thing without infringing the patent, if he uses means substantially different from those of the patent. To hold the contrary of this rule would be to retard, and not to promote the progress of the useful arts.*"

O'Reilly v. Morse, 15 How. 62;

Steam Gauge & Lantern Co. v. Mfg. Co., 29 Fed. 447;

Johnson Furnace Co. v. Western Co., 178 Fed. 819;

Smith v. Downing, Fed. Cas. 13,036.

### Driving Shaft.

Defendant does not infringe claims 1, 2, 4, 5 and 9 of the Lyndon patent in suit. In defendant's device there is no driving shaft within the meaning of the claims.

The driving shaft is properly pointed out by Mr. Henry as *shaft 6* of the Lyndon patent. [Record, Vol. 1, page 321, ans. to Q. 214.] This shaft 6 performs

several functions. (1) It drives the speed sensitive device, *dynamo* 8. (2) It positively, through gear connections, moves both water gate and by-pass valve.

Mr. Henry has pointed out the shaft just below the fly balls of defendant's device as the equivalent of the driving shaft of the Lyndon claims. [Record, Vol. 1, page 327, ans. to Q. 270.]

It is manifest that said shaft pointed out in defendant's device does not perform the function of the driving shaft 6 of the Lyndon patent. *It does not move the water gate nor the auxiliary relief valve. No power is transmitted through it as in the Lyndon patent to move either of the valves of the nozzles. An element may be an equivalent if it does more, but never if it does less.*

*There is no such driving shaft in defendant's device.* See testimony of defendant's witnesses, E. S. Cobb, Record, Vol. 2, pages 646, 655 and 661, and S. L. Berry, Record, Vol. 3, pages 1051, 1054.

### Reversing Clutch Gear.

Defendant does not infringe claims 1, 2, 4, 5, 8 and 9 of the patent in suit because in defendant's device there is no "reversing clutching gear" nor "reversing gear" and does not infringe claims 3, 6 and 7 of said patent because in defendant's device there are no "means for operating the water gate in either direction" within the meaning of the patent in suit.

"Clutch" is defined in Webster's New International Dictionary as a "coupling for connecting two working parts as shafts or a shaft, and a pulley permitting either to be turned at will into or out of gear with

the other, as by moving a lever. The two principal types of clutch are the friction clutch and the claw clutch in which jaws or claws interlock when pushed together."

"*Mechanics*": a power transmitting device operating as by friction or interlocking, for securing or breaking rotative continuity as between two shafts or a pulley and a shaft. (Funk and Wagnalls Standard Dictionary.)

"*Clutch*" (in mechanics): a movable coupling or locking and unlocking contrivance used for transmitting motion or for disconnecting moving parts of machinery. (Century Dictionary.)

This "clutch gear" of the Lyndon patent is pointed out by E. S. Cobb, Record, Vol. 2, page 647, Q. 102, 103; Mr. Henry, Record, Vol. 1, page 333, Q. 259; S. L. Berry, Vol. 3, pages 1055-1057, Q. 191-193.

The patentee, Lyndon, has used the term "clutch gear" in its strictly technical and proper sense. There is no question as to what element is intended by him by the language of his claims. The experts agree substantially on the element of the Lyndon drawings intended to be described by the term "clutch gear". Compare testimony of E. S. Cobb, Record, Vol. 2, page 648, answers to Q. 104-107; G. J. Henry, Jr., Record, Vol. 1, page 322, Q. 217-228; and Prof. Cory, Record, Vol. 2, page 444, Q. 265.

Unquestionably the same elements pointed out as the "reversing clutch gear" and "reversing gear" in claims 1, 2, 4, 5, 8 and 9, also constitute the "means for operating the water gate operating shaft in either direction" of claim 3. Shaft 6 is clearly referred to

in the patent specification as the “driving shaft” and is so pointed out by complainant. [Record, Vol. 1, page 321, Q. 214.] *Shaft 12* is distinctly referred to in the patent specification as the “water gate operating shaft” of all the claims, except claims 8 and 9. See Lyndon patent specification, page 4, line 109, claim 1:

“In a governor for water-wheels, the combination with a water-gate-operating shaft and a driving-shaft, of a reversing clutch-gear, *adapted to connect the water-gate-operating shaft to the driving-shaft in reverse driving relations, \* \* \**”.

Shafts 6 and 12 are manifestly the only shafts connected by the reversing clutch gear in reverse driving relations.

In the Lyndon patent specification, line 129, page 4, claim 2, we find substantially the same language.

Lyndon specification, page 5, line 11, *et seq.*, refers to the water-gate-operating shaft and the returning device provided with a clutch connection *to said shaft*, leaving no possible doubt that shaft 12 is intended as the “*water-gate-operating shaft*”.

In the Lyndon patent specification, page 5, line 23, claim 4, clearly indicates that the shaft 12 is the water-gate-operating shaft.

In the Lyndon patent specification, page 5, line 37, claim 5 also clearly designates the shaft 12 as the water-gate-operating shaft.

In claims 8 and 9 of the Lyndon patent, however, the context is such as to compel the conclusion that



Lyndon meant the shaft 20 by the term "water-gate-operating shaft".

Shaft 6 being the driving shaft, and shaft 12 being the water-gate-operating shaft of claim 3, the only element coming within the description of "means for operating the water-gate-operating shaft in either direction" is the "clutch gear" or "reversing clutch gear", 9, 10, 13.

Claims 6 and 7 refer to this "clutch gear" a little more indefinitely in that they included possibly the shafts 12 and 20 with their operative connections, nevertheless the principal part of "means for operating the water gate in either direction" of these claims is the aforesaid "reversing clutch gear".

One might suppose that the phrase "means for operating the water gate in either direction" warrants a broader range of equivalents than the language "a reversing gear and shafts 12 and 20" but this is not the law. A patentee is only entitled to the specific means shown in his specification and drawings, or their mechanical equivalents. To permit him to so broaden his claims by the use of indefinite language would often amount to giving him a monopoly of the principle or result, thus barring all other inventors from arriving at the same result by different means. The word "means" is often used in patent claims to avoid an awkward repetition of a number of elements. It is certainly obvious that the court must look to the specification and drawings to determine whether the "means" for performing a given function is operative and practical, because if the patentee's means will not

do what they are intended to do, he has not conferred any benefit on the public, and the court will and must also compare such “means” with those used by a defendant in order to properly determine the question of infringement.

In Walker on Patents (5th Ed.), sec. 117a, page 137, it is said:

“Where some of the parts of a combination operate therein to give motion to other parts, which do the final work of the combination, it is proper to specify the former by the use of such terms as ‘means,’ ‘mechanism,’ or ‘devices’ for giving that motion, except when these terms are applied to an element or part which constitutes the essence of the invention. If they are used under such circumstances the claim will be regarded as functional. *But such general language will not include all means, mechanism, or devices which can perform that function, but only those which are shown in the patent, and their equivalents.* And in this case also, the question whether other means, mechanism, or devices are equivalents of those shown in the patent, will be determined by the established rules on that subject, *rather than by any apparent precision or elasticity of the language used in the claims to designate the parts involved in the inquiry.*” (Italics ours.)

That this conclusion is concurred by complainant is attested by the fact that complainant points out the same element in defendant’s device as the equivalent “*reversing clutch gear*” and “*means for operating the water gate in either direction.*” [See Record, Vol. 1,

lines 14-16 of page 217, where Mr. Henry points out the cylinder "W" of defendant's Cottonwood Plant; page 218, lines 4-5, where he points out the cylinder F-F of defendant's Division Creek Plant; while on page 322, answer to Q. 217, he points out said cylinder F-F and cylinder W as *reversing clutch gears*.

With all the expert qualifications of complainant, Henry, and with his long study of the Lyndon patent, *as well as his great interest in the outcome of this suit*, complainant has not been able to distinctly and positively point out in defendant's device any mechanical equivalent of the "*reversing clutch gear*" or the "*means for operating the water gate in either direction*", as called for by the claims of the patent in suit. The attention of the court is called to the wavering, uncertain and contradictory character of Mr. Henry's testimony on cross-examination as to this "*reversing clutch gear*" and such "*means for operating the water gate in either direction*". See Record, Vol. 1, pages 322-324, Q. 219-227.

Prof. Cory (the only other witness on behalf of complainant who attempted to point out mechanical equivalency) does not agree with Mr. Henry. See Record, Vol. 2, pages 444-446; Q. 265-271. *Prof. Cory admits that he does not find physical equivalents of the "clutch gear,"—except so far as result only is concerned.*

There is no equivalency in the legal sense unless there is not only equivalency in result but also that such result is obtained by substantially the same means cooperating together in substantially the same manner.

Judge Baker in *Engle Sanitary & Cremation Co. v. City of Ellwood*, 73 Fed. 484, says:

“‘One thing, to be the equivalent of another, must perform the same function as that other; and, while it can be such an equivalent if it does more than that other, it cannot be such equivalent if it does less.’” (Bottom of page 485-486.)

*“And it is an essential rule, governing the application of the doctrine of equivalents, that not only must there be an identity of function between the two things claimed to be equivalents, but that function must be performed in substantially the same way by an alleged equivalent, as by the thing of which it is alleged to be an equivalent, in order to constitute it such.”* (Top of page 486.) (Italics ours.)

See also,

*Machine Co. v. Murphy*, 97 U. S. 120;

*Roller Mill Patent*, 156 U. S. 261;

*Seeley v. Electric Co.*, 44 Fed. 420.

*Appellant's expert, Prof. Cory, finally admits, on cross-examination, that the elements pointed out by Mr. Henry as being the equivalent of Lyndon's "clutch gear" do not and cannot perform the function of such "clutch gear". See Record, Vol. 7, pages 2450-2453, Qs. 959-961; Record, Vol. 7, pages 2455-2457, Qs. 967-973.*

Complainant's attempt to point out in defendant's apparatus the equivalent of the clutch gear completely fails. Mr. Henry's testimony is uncertain and contradictory. Prof. Cory contradicts Mr. Henry. Prof. Cory admits equivalents only in result and finally admits no equivalency of the parts mentioned by Mr.



Henry, and in so doing gives a good and sufficient reason therefor.

See testimony of Cobb, Record, Vol. 2, page 648, answer to Q. 104 to page 650, answer to Q. 107; Berry, Record, Vol. 3, page 1057, Q. 194 to page 1059, Q. 196.

The omission of the single element of “reversing clutch gear” or what has been treated as the same thing by complainant, “means for operating the water gate in either direction” from the claims in suit requires a finding of non-infringement and a dismissal of the bill for want of equity. Engle Sanitary & Cremation Co. v. City of Ellwood, 73 Fed. 484.

### **Clutch Connection to Said Operating Shaft.**

In defendant’s device there is no “clutch connection to said operating shaft” within the meaning of said claims 3 and 5, nor any mechanical equivalent thereof.

In his testimony Mr. Henry failed to clearly point out said “clutch connection” of claim 3. His testimony is contradictory. Record, Vol. 1, page 195, answer to Q. 117 to page 201, answer to Q. 119, Exhibit -Z- and Z-Z, differentiated and clutch clearly pointed out as white metal parts of Exhibit -W-. Record, Vol. 1, page 197, line 14, -M- on Division Creek, exhibits distinctly referred to as designating “automatic clutch control valve”. Referring [Record, Vol. 1, page 217] to Exhibits E, F, G, Cottonwood Plant, Henry points out [Record, Vol. 1, page 217, line 10 from bottom] a “returning device” for said controller provided with a clutch connected to said operating

shaft as parts marked L, K, M. clutch portion shown in Exhibit -M- appears in the exhibit to be the means for regulating the flow of oil from one side of the piston of the dash pot. -M- is distinctly referred to in Record, Vol. 1, page 135, line 13, as "clutch". Referring [Record, Vol. 1, page 218, first twenty lines) to Exhibits H, I, J, K and L, Henry points out the clutch at Z-Z.

Record, Vol. 1, page 219, Henry points out the same parts which he has heretofore pointed out as "clutch", namely, the means of regulating the flow of oil from one side of the dash pot to the other as the "actuating means" controlled by said "controlling means".

See Record, Vol. 1, page 232, answer to Q. 258 to page 334, answer to Q. 264; Record, Vol. 1, page 339, Q. and answer 276; Record, Vol. 1, page 334, lines 8-12.

The parts pointed out finally by Henry as alleged equivalents of such clutch connection are not such in fact. They do not perform substantially the same function. They do not constitute substantially the same means, nor embody substantially the same idea of means. They do not operate in substantially the same manner.

The testimony of Prof. Cory (the only other witness besides complainant, who on behalf of complainant has attempted to point out alleged equivalents in defendant's devices) is also contradictory. See Prof. Cory's testimony given January 26th, 1914, Record, Vol. 2, page 461, Q. 328 to page 462, answer to Q. 332.

Prof. Cory points out part marked -e- on Exhibit K.K.K. Record, Vol. 2, page 464, Q. and answer 342, Prof. Cory points out part marked -e- on K.K.K. as clutch of claim 5. Approximately eighteen months later Prof. Cory is again called in rebuttal and contradicts his former testimony. Prof. Cory then confuses clutch connection of claim 3 with the reversing clutch gear. Record, Vol. 7, pages 2407-2411, Q. 878-883. (This cross-examination finds proper basis in the direct, see Record, Vol. 6, page 2234, Q. 692; page 2236, Q. 697-8; page 2239, Q. 709.) See further Prof. Cory's attempted correction of his testimony on re-direct examination. Record, Vol. 7, page 2419, Q. 901; page 2421, Q. 905. But see his answers on re-cross-examination, Record, Vol. 7, page 2427, RXQ. 925; page 2450, RXQ. 957-967; page 2456, RXQ. 971-2.

The parts first pointed out by Prof. Cory as equivalents of the "clutch connection" of claim 3 do not coincide with those previously pointed out by appellant Henry.

The parts finally on rebuttal pointed out by Prof. Cory as the equivalents of the "clutch connection" of claim 2 do not coincide with any of those pointed out by Mr. Henry. There is an irreconcilable conflict in the testimony on behalf of complainant as to the mechanical equivalent of the clutch connection of claim 3.

The parts pointed out first by Cory as the equivalents of said "clutch connection" are not such equivalents. They do not perform the function of such clutch con-

nection. They do not constitute substantially the same means. They do not operate in substantially the same way. Neither can the parts which Prof. Cory has pointed out finally on rebuttal be considered mechanical equivalents of the "clutch connection" of claim 3 because they do not perform substantially the same function; they do not constitute substantially the same means; nor do they operate in substantially the same way.

Mr. Cobb testifies that no such "clutch connection" nor its mechanical equivalent is to be found in defendant's device. [Record, Vol. 2, page 653, ans. to Q. 109; page 658, 4th line; Vol. 3, pages 846-847, ans. to Q. 711.]

Mr. Berry testifies that no such clutch connection as described in claim 3 of the patent in suit nor its mechanical equivalent is to be found in defendant's device. [Record, Vol. 3, page 1060, ans. to Q. 197-200; page 1075, ans. to Q. 211; page 1083, ans. to Q. 216-217; page 1100-1101, ans. to Q. 234.]

Prof. Cory has admitted that the dash pot with its piston and piston rod cannot be used as a substitute for a clutch gear or that which is the same thing, a clutch connection. Prof. Cory has admitted that the elements named by Mr. Henry as the equivalents of such "clutch connection" of claim 3 are not an equivalent.

Defendant's witnesses, Cobb and Berry, have testified distinctly and positively that there was no equivalent of such clutch connection to be found in defendant's device.



The preponderance against any alleged equivalents is clearly in favor of defendant. Messrs. Cobb, Berry and Cory all deny the uncertain and wavering testimony of Henry as to the existence, in defendant's devices, of this clutch connection of claim 3, or its equivalent.

The burden of proving infringement is upon the plaintiff and doubt will be resolved against him.

Mitchell v. Tilghman, 86 U. S. 287;

Price v. Kelly, 154 U. S. 669.

### **Means for Reversely Controlling the Clutch Gear.**

Defendant's device does not contain "means for reversely controlling the operation of such clutch gear" of claim 1, or the "electromagnetic means controlling such clutch gear" of claim 2, or the "two electromagnetic devices for reversely operating the reversing clutch gear of claim 5.

These elements refer to magnets 15 and 16 and, in case of claim 1, probably, includes their armature 17. This is clear from the context of the Lyndon patent. [Specification, page 1, lines 92-97; page 3, lines 75-82.] This is admitted by witness Prof. Cory. [Record, Vol. 2, page 449, answer to Q. 283.]

Not containing the "clutch gear" or reversing clutch gear as previously shown it logically follows that defendant's device cannot contain any means for operating the clutch gear.

Complainant has been unable to point out in defendant's device any equivalent of said "means for controlling or operating the clutch gear" as called for in claims 1, 2 and 5.

On the contrary complainant mistakes the meaning of the claims and makes no attempt to point out any equivalent of the element called for by the claims. [See Record, Vol. 1, page 330, Q. 248.] Mr. Henry mistakes the solenoid 33 for “electromagnetic devices” and laboring under this error of the supposing that solenoid 33 is meant by electromagnetic devices of the claims and confusing magnets 15 and 16 with said solenoid, Mr. Henry points out part of the line to line valve. [See Record, Vol. 1, page 325, Q. 231; page 330, ans. to Q. 248-250.]

While Mr. Henry points out the line to line valve of Exhibit Z as the alleged equivalent of solenoid 33, mistaking that for the element called for by claims 1, 2 and 5, as “electromagnetic means controlling the clutch gear” his expert witness, Prof. Cory, points out the same line to line valve as equivalent of magnets 15 and 16. [Record, Vol. 2, pages 448-450, ans. to Q. 281-287.]

Prof. Cory correctly points out solenoid 33 as “an electromagnetic device connected to such dynamo and controlling the clutch gear controlling means.” [Record, Vol. 2, page 451, ans. to Q. 291.]

Prof. Cory, however, adds to the confusion by pointing out the same identical parts which he has referred to as equivalents of magnets 15 and 16 as equivalents of solenoid 33. [Record, Vol. 2, pages 451-452, Q. 292-295.] Later Prof. Cory increases the confusion by pointing out two pipes leading from the cylinder B as the two electromagnetic devices of claim 5. [Rec-

ord, Vol. 2, pages 457-458, ans. to Q. 315-317, page 527, ans. to Q. 515.]

(By way of interruption permit defendant to call the court's attention to the fact that these same pipes have been very much over-worked for "equivalents" of elements of the Lyndon claims. They have been also pointed out by the said Prof. Cory as the equivalent of the lever 26 of the patent in suit [see Record, Vol. 2, page 458, ans. to Q. 318-321] and also as the equivalent of the solenoid 33 [see answer to Q. 410, Record, Vol. 2, page 493]).

The absurdity of attempting to read the line to line valve, for regulating the flow of fluid under pressure to the cylinder operating the gates, as the equivalent of *first*, the solenoid 33 and, *second*, the magnets 15 and 16 is manifest; magnets 15 and 16 perform different and separate functions, one is being operated while the other is at rest. They do nothing but attract an armature which operates a lever. The line to line valve marked "controller" on "Complainant's Exhibit Z-Z" does not perform any such function.

Mistaking the solenoid 33 as the element called for by claims 1, 2 and 5 as the means for reversely controlling the operation of the clutch gear results in a total failure to point out any equivalents of the magnets 15 and 16 and the attempt of Prof. Cory is contradictory of the testimony of Mr. Henry who has used the elements pointed out by Prof. Cory as the equivalent of something else.

It should also be noted in passing that complainant also attempts to read this line to line valve as the

element described as a “controller” which is clearly described as the lever 26 in the patent specification. This matter, however, will be further elaborated when we come to consider the element described as “controller” in the claims.

This line to line valve, therefore, is referred to as *the equivalent* of the solenoid 33; also *the equivalent* of magnets 15 and 16; and also *the equivalent* of the lever 26.

Mr. Cobb has testified that there is no such element, in defendant’s device, as the means for reversely controlling the operation of the clutch-gear of claims 1, 2 and 5 of the patent in suit. [See Record, Vol. 2, page 651, lines 16-18; page 646, lines 21-24.] Mr. Berry also so testifies. [Record, Vol. 3, page 1051, next to last paragraph; page 1052, 3rd paragraph of answer to Q. 187; lines 7 and 8 of page 1075.]

It is obvious that none of the things that have been suggested by either Mr. Henry or Prof. Cory can be considered as substantially the same means as the magnets 15 and 16 and their armature 17. None of the devices that have been suggested by either Mr. Henry or Prof. Cory perform the functions of the magnets 15 and 16 and their armature 17; much less in substantially the same way; on the contrary the idea of means and the interrelation of the component parts is distinct and non-equivalent.

### **Dynamo.**

Defendant’s devices contain no dynamo such as described in claims of the patent in suit, nor the mechanical equivalent of such dynamo.



Mr. Henry has pointed out the fly balls of defendant's devices as the mechanical equivalent of such dynamo. The fly balls and the connections, or any of their connections, cannot be described as the mechanical equivalent of the dynamo of the claims in suit. They do not perform the same function as the dynamo of the claims in suit. The dynamo of the patent has *two* functions, *first* to supply the power necessary to provide a path of travel for the force which is necessary to actuate certain levers. *Second*, to supply the power for force necessary to actually throw such levers. The fly balls of defendant's device merely, by operating a piston in a cylinder, open or close the pipes controlling the flow of power fluid from a source of supply. The centrifugal force of the rotation of the fly balls is totally unlike the electromotive force of the dynamo utilized in actually throwing the levers. The important function of furnishing power to actually throw levers to make connections is not to be found in the fly balls of defendant's device. The fly balls of defendant's device do not operate in substantially the same way as the dynamo of the patent in suit. The electromotive force of the dynamo of the patent in suit first opens a path for itself and controls the opening and closing of such path and then the same electromotive force from said dynamo moves in that path to throw the levers which make connections to move the water gate and by-pass valve; while the centrifugal force of the fly balls does not move any levers to make any clutch connection whatever, the actual mov-

ing of any connection being done by fluid under pressure coming from another source.

*“One thing to be the equivalent of another must perform the same function as that other; and while it can be such an equivalent if it does more than that other, it cannot be such equivalent if it does less.”* (Italics ours.)

Engle Sanitary Cremation Co. v. City of Ellwood, 73 Fed. 484.

### Solenoid 33.

Defendant does not infringe claims 1, 2, 5 and 9 of the patent in suit, as in defendant's device there is no equivalent of an “*electromagnetic device* connected to such dynamo, and controlling the clutch-gear-controlling means”, of claim 1, nor any *solenoid* connected to said dynamo”, of claim 2, nor any “solenoid device energized by said dynamo” of claim 5, nor any “electromagnetic device connected to said dynamo”, of claim 9.

In the patent in suit this element is designated as the *solenoid 33*.

Prof Cory [Record Vol. 2, page 451, Ans. to Q. 291] points out the solenoid 33 as the electromagnetic device of claim 1; and points out solenoid 33 as “the solenoid connected to said dynamo” of claim 2. [Record, Vol. 2, pages 453-4, Ans. to Q. 300.]

Appellant Henry's testimony as to an alleged equivalent of this solenoid 33 is contradictory. (1) He has pointed out “connections between the fly balls for transmitting movement to and making sensitive to speed changes.” [Record, Vol. 1, page 328, Ans. to

Q. 242-243.] (2) He afterwards changes his testimony and points out the part marked "controller" on Exhibit Z-Z [Record, page 329, Ans. to Q. 245], including therein, "its casing and parts surrounding it in, co-operation with which it moves." [Answer to Q. 246, page 329.]

Prof. Cory does not agree with Mr. Henry as to the equivalency of solenoid 33.

Prof. Cory points out the pair of pistons marked B of blue print KKK. [Record, Vol. 2, page 454, Ans. to Q. 301.] Prof. Cory also confusingly points out the pipes D-D as the equivalent of the electromagnetic device, solenoid 33, of claim 9. [See Record, Vol. 2, pages 492-494, Ans. to Q. 405-410.]

There is the utmost confusion in the record in pointing out the equivalent of the solenoid 33, because,

The same parts have been pointed out as the equivalent of the lever 26.

Prof. Cory [Record, Vol. 2, pages 458, 459, Q. 318-321], pointed out as the device controlled by said solenoid. [Record, Vol. 2, page 492, Q. 405 to page 494, ans. to Q. 410.]

When Mr. Cobb is asked to point out in defendant's device a "controller" he very properly points out the fly balls and their connections. These are clearly the speed sensitive devices of defendant's governor, and really perform the function of controlling the flow of oil or water from one side of the piston of the cylinder to the other, being in fact, part of the fly ball mechanism. [See Record, Vol. 2, page 655, line 14; page 659,

4th and 5th lines from bottom; Vol. 3, page 845, Q. 706.]

Mr. Cobb testifies that there is no equivalent of solenoid 33 in defendant's device. [See Record, Vol. 2, page 646, line 13; page 647; page 650, 3rd line from bottom; page 651, line 19; page 660, line 4; page 661, line 9.]

Mr. Berry corroborates Mr. Cobb that there is no equivalent of the solenoid 33 in defendant's device. [See Record, Vol. 3, page 1086, line 9; page 1087, line 6; Vol. 4, page 1367, 6th line from bottom; page 1371, line 13.]

Complainant has not sustained the burden of proof in pointing out an equivalent of said solenoid 33, on the contrary, complainant contradicts himself and is in turn contradicted by his own witness as to the alleged equivalent of the solenoid 33. The same parts which have been pointed out as the equivalent of this solenoid 33 have also been pointed out as being an equivalent of other mechanism of the patent in suit. Two duly qualified experts on behalf of defendant have stated positively that there is no mechanical equivalent of such solenoid 33 to be found in defendant's device.

It is manifest, that neither (1) the casing of the cylinder, and (2) the parts surrounding it in co-operation with which it moves as pointed out by Mr. Henry, nor the pair of pistons marked B on Exhibit KKK are mechanical equivalents of the solenoid 33. They cannot be considered substantially the same means. They do not operate in substantially the same manner. They do not perform substantially the same functions.



Mr. Lyndon has positively limited himself to a certain kind of means, namely: "electromagnetic," and to a certain kind of device, namely: a solenoid device.

The claims should not be construed as though these words of limitation were not included therein.

"Some persons seem to suppose that a claim in a patent is like a nose of wax which may be turned and twisted in any direction, by merely referring to the specification, so as to make it include something more than, or something different from, what its words express. The context may undoubtedly be resorted to, and often is resorted to, for the purpose of better understanding the meaning of the claim; but not for the purpose of changing it and making it different from what it is. The claim is a statutory requirement, prescribed for the very purpose of making the patentee define precisely what his invention is; and it is unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms."

White v. Dunbar, 119 U. S. 47.

### **Means for Resisting the Action of Solenoid 33, Springs 37-38-27-28-29.**

In defendant's device there are no "means for resisting the action of said electromagnetic devices in such manner, that at normal speed the clutch mechanism will be disengaged, but on increase or decrease from normal speed the clutch will be operated to govern the water-gate through its operating-shaft," (claim 1). These means are springs 37-38-27-28-29. This is plain from an examination of the patent speci-

fication. Prof. Cory agrees that springs 37-38 and 27-28-29 are the means pointed out, but also adds springs directly beneath magnet coils 15 and 16. [See Record, Vol. 2, page 452, 11th line from bottom of page.] Prof. Cory illustrates his failure to thoroughly understand the disclosure of the patent in suit in thus including the springs beneath the magnets 15-16 but the variance is immaterial for the purpose of our present argument.

As alleged equivalents Mr. Henry points out the "vertical connecting rod between the fly balls and screw threads on the valve stem, which rod is indicated in its lower portion by Y. G. on Exhibit Z-Z and forms the valve stem." [See Record, Vol. 1, page 329, last two lines.] *Prof. Cory does not agree with Mr. Henry but points out a "pressure fluid" contained and capable of being admitted and discharged within the controlling cylinder B on Exhibit KKK.* [Record, Vol. 2, page 452, Q. 297.]

Complainant has not sustained the burden of proving infringement by proving defendant's device contains the equivalent of "means for resisting the action of said electromagnetic device in such manner, that at normal speed the clutch mechanism will be disengaged, but on increase or decrease from normal speed the clutch will be operated to govern the water-gate through its operating shaft".

Does appellant rely upon the testimony of his expert, Prof. Cory, or upon his own testimony? Is either correct?

Two witnesses on behalf of defendant testified that no such means are to be found in defendant's device. See testimony of E. S. Cobb, Record, Vol. 2, page 646, 7th and 8th lines from bottom of page; testimony of S. L. Berry, Vol. 3, page 1051, Q. 186.

It is obvious upon comparison of the functions of the parts suggested by complainant Henry and his expert that neither the rod between the fly balls as suggested by Mr. Henry nor the pressure fluid can be properly described as means for resisting the action of the cylinder or piston in the cylinder.

The rod pointed out by Mr. Henry clearly does not resist any action of the line to line valve or its piston in the sense of the patent, or any other sense; *its function is not to resist but to convey power*. It is likewise obvious that the power fluid suggested by Prof. Cory does not resist the action of anything within the meaning of the patent; the power fluid has an entirely different function of actuating the piston of the operating cylinder.

#### **Device Controlled by Solenoid 33 and Carrying a Contact Device. Claim 2.**

Defendant does not infringe claim 2 of the patent in suit as in defendant's device there is to be found no "device controlled by said solenoid and carrying a contact device" or its mechanical equivalent.

This element is clearly pointed out by Prof Cory, [Record, Vol. 2, page 458, Q. 318-321], as lever arms 26 pivoted at 26a, contacts 40-40a 41-41a.

In defendant's device there is no element to which the description could properly apply, nor which per-

forms substantially the same function. See testimony of S. L. Berry, Record, Vol. 3, page 1052, Q. 187; E. S. Cobb, Record, Vol. 2, page 651, lines 22-23.

Mr. Henry has pointed out "pipe connections or parts to the water-gate operating means and the power fluid engaged in the action of the controller for the purpose of shifting the piston head and piston rod in said operating cylinder" [Record, Vol. 1, page 331, Q. 254], as such alleged equivalent.

*(Note: This same power fluid has been pointed out by Prof. Cory [Record, Vol. 2, page 452, Q. 296-7] as the equivalent of the springs 37-38-27-28-29.)*

*Prof. Cory admits that he finds no physical equivalent, but rather inconsistently finds the equivalent in the pipes D-D (which have previously been pointed out T. 328, lines 16 to 26, by him as two electromagnetic devices.) [See Record, Vol. 2, page 458, Q. 319-320.]*

Prof. Cory having previously pointed out the pair of pistons within the cylinder marked -B- on Exhibit KKK, as the equivalent of solenoid 33 [Record, Vol. 2, page 454, Q. 301], *points out the same pair of pistons as corresponding with contacts 40-40a, 41-41a, the pair of pistons must thus be the equivalent of solenoid 33, and also the contact device of claim 2.* [Record, Vol. 2, page 529, Q. 520-521.]

It is apparent, therefore, that there is an irreconcilable conflict in the testimony of complainant and his expert. Surely it does not require argument to show that the pipes D-D of Exhibit KKK cannot be the equivalent of the lever arm 26 pivoted at 26a, and carrying a contact device. They are obviously totally



different elements, performing totally different functions. It does not require argument to show that the combination of (1) pipe connections and parts to the water-gate-operating means and a power fluid engaged in the action of the cylinder for the purpose of shifting the piston in said operating cylinder does not perform the functions of the lever 26 with its contact. There is no part of the lever 26 that can be compared with the power fluid.

In defendant's device there is no such element to which the description "a device controlled by said solenoid and carrying a contact device" could apply. *We have seen that there is no equivalent of the solenoid, and therefore obviously cannot be any equivalent of a device controlled by any solenoid.* There is obviously no contact device nor its equivalent in defendant's device. See testimony of E. S. Cobb, Record, Vol. 2, page 651, lines 22-23; testimony of S. L. Berry, Vol. 3, page 1053, first three lines.

### **Energizing Connections, Claim 2.**

Defendant does not infringe claim 2 of the patent in suit as in defendant's device there are no "energizing connections for the electro-magnetic gear controlling means controlled by said contact device".

*Cory finds no exact physical devices that are equivalent, but finds an alleged equivalent in the two pipes D-D which connect the cylinder marked -B- on Exhibit KKK with cylinder -A-. [Record, Vol. 2, page 459, Q. 322.]*

(Note: Cory has previously pointed out these same pipes D-D on Exhibit KKK [Record, Vol. 2, pages 457-8, Q. 315-316; page 527, Q. 515] as "two magnetic devices (magnets 15 and 16) and has used these same pipes D-D also as alleged equivalents [Record, page 458, Ans. to Q. 319-320] of a "device controlled by said solenoid 33" and "carrying a contact device", claim 2, namely: lever 26. These pipes have, therefore, been pointed out by Cory as (1) equivalent of magnets 15 and 16; (2) equivalent of lever 26; (3) equivalent of electric circuits through which magnets 15 and 16 are energized.)

On the other hand Mr. Henry points out "pipe connections or parts to the water-gate-operating means and the power fluid engaged in the action of the controller for the purpose of shifting the piston rod in said operating cylinder." [Record, Vol. 1, page 331, Q. 254.]

The testimony of Henry and Cory is thus contradictory and conflicting. Mr. Henry includes power fluid, as part of the "energization connections"; Prof. Cory only mentions pipes. Prof. Cory has previously pointed out the power fluid as the equivalent of the "means for resisting the action of the electromagnetic devices" of claim 1 (being the springs 37-38, 27-28 and 29). [Record, Vol. 2, page 452, Q. 296-7.]

There being no equivalent in defendant's device of the electromagnetic gear controlling means (magnets 15 and 16) it obviously follows there can be no energizing connections for said electromagnetic means.

See testimony of defendant's witnesses, E. S. Cobb, Record, Vol. 2, page 650, Q. 108; page 651, lines 19-24; S. L. Berry, Vol. 3, page 1052, Q. 187; page 1053, lines 3-6.

### Controller 26.

In defendant's device there is to be found no *controller* "responsive to changes of speed of the water-wheel", of claims 3, 4 and 8; nor any "circuit-controller" of claim 5; nor any "controller operated by said electromagnetic device and controlling said reversing-gear" of claim 9.

Each of the elements referred to in slightly different language in each of the said claims just mentioned relates to the same mechanical device, namely: *the lever 26 pivoted at 26a (and not to solenoid 33). It is clearly and explicitly so stated in several places in the specification of the patent in suit.* Line 26, page 2 of the specification, "*controller 26.*" Line 43, page 2 of the specification "circuit controller". Line 63, page 3 of the specification "controlling lever 26".

*Mr. Lyndon nowhere in his specification refers to the solenoid 33 as simply the "controller" as he has done with lever 26.* In claim 5 he refers to the solenoid 33 as a "solenoid device" and to the lever 26 as a "circuit controller." *In claim 9 of the patent in suit, Lyndon claims both elements, the lever 26 and the solenoid 33. He refers to the lever 26 as a "controller operated by said electromagnetic device" namely: solenoid 33.* Mr. Lyndon has several times in his specification and claims referred to lever 26 as a "*controller*" but has never so referred to solenoid 33,

although he has referred to solenoid 33 as a controlling solenoid.

*Prof Cory admits that there is no equivalent of the "circuit controller" in the infringing device.* [Record, Vol. 2, page 464, Q. 340-341.]

In construing the claims of a patent, the court should adopt the meaning obviously placed upon them by the applicant in his specification. Where he has distinctly referred to an element by a certain name, and distinctly claimed it by the same name in one of his claims, the court is warranted in assuming that he means the same element when he uses the same term in other parts of his specification, especially when there is no reason for placing any other meaning on the term, except perhaps, that it might be convenient for a plaintiff in attempting to make out a case of infringement. To turn and twist the claim like a nose of wax. *White v. Dunbar (supra)*.

"No patented invention can be practically or fairly understood or explained if the language of the claim is entirely disassociated from the specification and the claims and specification should be read together."

1900 Washer Co. v. Cramer, 169 Fed. 629.

See also:

General Electric Co. v. Richmond Street & Interurban Ry. Co., 178 Fed. 84;

Chicago Woodenware Co. v. Miller Ladder Co., 133 Fed. 541.

Louden Machinery Co. v. Strickler, 195 Fed. 751; on page 756 the court says:



“Elements in claims should be read with reference both to the structure and the function given in the description of the invention. Dictionary definitions should not be applied to words in claims if the patentee in and by his drawings and descriptions of parts and functions, has clearly supplied his own dictionary.”

Herzog v. N. Y. Telephone Co., 172 Fed. 425:

“While the invention of a patent must be measured by the claims, yet they cannot be considered to the exclusion of the specifications, but claims, specifications, and drawings showing the particular apparatus must be considered together, and must point out the principle by which the invention is practically operated, and, to make out a case of infringement, the apparatus of defendant must embody such a principle of operation.” (Syll. 1.)

*“The claims of a patent are to be construed in the light of the specifications, and while, when plain and specific, they cannot be extended, they MAY BE LIMITED THEREBY, and a claim is not to be defeated because it is broad in its language, when IT IS LIMITED BY THE SPECIFICATION, and susceptible of limitation.”* (Syll. 1.)

Dey Time Register Co. v. W. H. Bundy Recording Co., 169 Fed. 807.

Prof. Cory correctly refers to the lever arm 26 as the “circuit controller” of claim 5, but erroneously includes lever 43, pivoted at 43a, which last named element is mentioned in the same claim as a “circuit closer.”

The lever 43 obviously cannot be considered as part of the element of claim 5 mentioned as a “circuit con-

troller", as it is mentioned as a separate element and described as a "circuit closer" operatively connected with the aforesaid circuit controller, and adapted to energize said magnet on movement of the "circuit controller" in either direction.

A returning device is described and claimed in the patent in suit, and it is stated at lines 3-4, page 4 of the patent specification that its operation is to return lever 26 to normal position; it does not state anything about returning solenoid 33 to normal position.

It would not be proper to state that solenoid 33 is returned to any position or to normal position, solenoid 33 has a fixed and immovable position. Its core 35 being properly referred to only as a solenoid core and being so designated, wherever spoken of in the patent, is the only part of the mechanism which is movable.

In claim 3 of the patent "a controller" is claimed and a "returning device for said controller." This being read in connection with the express statement of the patentee that the "returning device" returns the lever 26 to normal position, and considered in connection with the obvious fact that the solenoid 33 cannot be returned to normal position, being immovable, compels the conclusion that the lever 26 is the "controller."

At line 7, page 4 of the specification of the Lyndon patent, it is distinctly stated that the lever 26 is the element that is returned to normal position by said returning device.

In claim 4, "a returning device for said controller" is called for showing clearly that lever 26 is the controller."

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COMPLAINANT HAS FAILED ABSOLUTELY TO SHOW IN DEFENDANT'S DEVICE ANY "CONTROLLER" WITHIN THE MEANING OF CLAIMS 3, 4, 5, 8 AND 9 OR ANY MECHANICAL EQUIVALENT THEREOF. Complainant ignores the fact that the lever 26 is the "controller" of the claims.

Mr. Henry, when not referring to any special claim, evidently takes "controller" to mean the same thing in all the claims, as in fact it does. [Record, Vol. 1, page 216, lines 16-17.] It should be noted that he makes no distinction between the "controller" of claim 4 and the "controller" mentioned generally in a previous comparisons which evidently was intended to apply to all the claims. [Record, Vol. 1, page 382, Q. 369-371.] HENRY HAS NOT ATTEMPTED TO POINT OUT ANY MECHANICAL EQUIVALENT OF SAID LEVER 26. Complainant has insisted (contrary to the express provisions of the specification and claims of the Lyndon patent) that solenoid 33 was the "controller", and thus endeavors to confuse the plain meaning of the patent.

*The controller 26 and the solenoid 33 are two separate and distinct elements in the claims of the patent in suit.*

Prof. Cory has pointed out the cylinder marked B on blue print KKK as the "controller for said operating means" of claim 3. [Record, Vol. 2, page 461, Q. 326.] It is obvious that the cylinder B on blue print KKK is not the mechanical equivalent of lever 26. It does not perform any of the functions of lever 26. The cylinder is a stationary part, while the

lever is a movable part. The lever makes and breaks electric connections, while the cylinder does nothing of the kind. The cylinder B on Exhibit KKK does not operate in substantially the same manner. *There is no comparison that seems possible as to mode of operation, they are entirely different elements.* Obviously they are not substantially the same means.

The testimony on behalf of complainant is inconsistent, in that (*with considerable variation*) the cylinder and certain of its parts controlling the flow of fluid under pressure has been pointed out as the equivalent of *both* the lever 26 and the solenoid 33 and the magnets 15 and 16.

In answer to Q. 248-250 [Record, Vol. 1, page 330], Mr. Henry points out part marked controller on Exhibit Z-Z as the equivalent of the solenoid 33, but mistakes solenoid 33 for magnets 15 and 16. While in answer to Q. 300-301 [Record, Vol. 2, page 453], Prof. Cory points out as equivalent of solenoid the *pair of pistons only* within the cylinder. (Exhibit KKK.) Prof. Cory shifts from his first position that *the pistons only* were the equivalent of the solenoid 33, and points out the cylinder -B- on Exhibit KKK *but departs completely from his former testimony by pointing out the pipes D-D on said Exhibit KKK as equivalent of the electromagnetic device “(solenoid 33)”* [Record, Vol. 2, pages 493-4, Q. 407-410], and then Prof. Cory contradicts himself and comes back to the proposition that solenoid 33 finds its equivalent in cylinder marked B on Exhibit KKK. [Record, Vol. 2, page 517, Q. 484-486.] Thereafter, in answer to Q. 508-9 [Record, Vol.



2, page 526], Prof. Cory again *shifts to the position that the two pistons, distinctly pointed out by him [Record, Vol. 2, page 453, Q. 300 and 301] as equivalent of solenoid 33 are to be considered as an equivalent of contacts carried by lever 26, the comparison, however, leading to the absurdity of having the contacts directly carried by the core of the solenoid and thus eliminating entirely controller lever 26.*

The weight of evidence as well as the weight of reason preponderate on the side of the defendant.

E. S. Cobb testifies that there is no such controller nor its equivalent in defendant's device. See Record, Vol. 2, pages 553-4, Q. 109; page 655, lines 14-19; page 659, 4th line from bottom of page; page 661, lines 12-14.

S. L. Berry testifies that there is no such controller nor its mechanical equivalent in defendant's device. See Record, Vol. 3, page 1063, answer to Q. 198; Vol. 4, page 1466, Q. 1445-6; page 1366, Q. 1099-1109; page 1434, Q. 1389.

### Returning Device.

In defendant's device there is no "returning device" for said controller, as called for by claims 3 and 4; nor any "returning device" adapted, when operated to return the circuit controller to normal position, as called for in claim 5 of said patent. The language in each of these claims refers to the same mechanical element, namely: the rod 25. *It is distinctly so stated in the patent specification, line 12, page 12:*

"A returning device consisting of a rod 25, connected by a pivoted link or connecting-rod 25a

with the disk 22, passes through a hole in the controller-lever 26, pivoted at 26a to a fixed support, and through a fixed abutment or frame piece 30."

*Complainant's witness Prof. Cory admits this. [See Record, Vol. 2, page 461, Q. 327, et seq.]*

The term "returning device" in each of the claims 3, 4 and 5 of the patent in suit cannot be construed to include either the clutch disks 22-23 or the magnet 32. The fact that Lyndon in one instance, rather confusingly refers to clutch disk 22 23 and magnet 32 as constituting a "returning device" (specification, page 3, lines 116, *et seq.*), does not alter this fact. Magnet 32 is not a part of the returning device. *It is spoken of at line 13, page 4 of the specification as a "clutch magnet" for the "returning device."* It is claimed as a separate element in each of the claims, namely: claims 3, 4 and 5 in which the returning device is claimed as an element. Disks 22 and 23 are not part of the returning device. In each of the claims in which the returning device is called for, namely: claims 3, 4 and 5, disks 22 and 23 are claimed as a separate element, namely: as a clutch" or "clutch connection," in claims 3 and 5, and is included as part of the actuating means controlled by said "controlling means" in claim 4.

*When the patentee uses the term "returning device" in his specification and claims, he thus means simply a rod centered by springs and attached at one end to a clutch.*

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The term "returning device" is a most vague and general term as a very large proportion of mechanical parts might be referred to as "returning devices."

The insufficiency of language to adequately describe mechanical devices is recognized by the statutes of the United States, and rules of the Patent Office requiring drawings and illustrations. In order that an inventor may not by the use of vague and general expressions be granted a monopoly over things he has not really invented, his drawings must be referred to and read with his descriptions.

It is not the law that the function of a device alone may be monopolized.

O'Reilly v. Morse, 15 How. 62;

Diamond Match Co. v. Ruby Co., 127 Fed. 341,  
348;

Corning v. Burden, 15 How. 252;

Dryfoos v. Weise, 124 U. S. 32;

Westinghouse v. Boyden Power Brake Co., 170  
U. S. 537;

Goshen Co. v. Bissell Co., 72 Fed. 67;

National Brake Shoe Co. v. Interchangeable  
Co., 106 Fed. 693;

Union Co. v. Diamond Co., 162 Fed. 148.

In *Reis v. Barth Mfg. Co.*, 136 Fed. 850, the Circuit Court of Appeals for the Seventh Circuit says:

"Where a new result has been attained by some patentable mode of operation, the patentee cannot have a monopoly of the new result. It is open to anyone to devise and patent a new means of producing the same result—a means that has

a different principle of operation,—and one who succeeds in doing this is not an infringer of the older patent.” (Page 853.)

Only the specific means or its clear mechanical equivalent is protected by a patent claim.

*To grant complainant a monopoly over every means which might, by any straining of language be called a “returning device” without reference to the specific device illustrated in his drawing would be to grant him a monopoly of a function or result.*

*The question before the court is whether there is found in defendant’s device any rod like that illustrated at 25, in the drawing of the patent in suit, centered by springs and connected at one end with the disk of a clutch.*

It is important to determine first what the function and purpose of this rod 25 is in order that we may then compare the elements of defendant’s device which have been suggested as its equivalent.

The purpose and function of this rod 25 (designated as “a returning device” in the claims) is clearly stated by Lyndon to be to prevent the governor from over-running.

The specification of the Lyndon patent is most clear and explicit as to the function of this rod 25.

“The rod 25, disks 22 and 23, and the controlling clutch-magnet 32 constitute a returning device for preventing the governor from over-running—that is, moving the water-wheel gate a greater distance than is actually necessary for proper regulation—thus necessitating a second movement of the gate in an opposite direction,



which in turn may overtravel and require the gate to be moved back again."

Lyndon patent specification, pages 3, lines 116-125.

There is no rod 25 in defendant's device. Nor is there any equivalent thereof. Mr. Henry has contradicted himself in attempting to point out in defendant's device a mechanical equivalent for such rod 25. These many contradictions in the testimony of appellant Henry must serve to emphasize the radically different mode of operation, principle of organization, and interrelation of elements making up defendant's device. These several contradictions serve to emphasize the extreme stretch required on the part of appellant in his attempt to compare defendant's device with that of the Lyndon patent, either as a whole, or element for element of any of the claims of the Lyndon patent.

Mr. Henry points out on Exhibit KK (1) a dash pot, (2) associated parts shown close to the fly balls, (3) each of the rod and lever connections to the water gate operating shaft and to the controller; (4) the actuating rack, and (5) pinion; (6) vertical stem on which pinion is placed; (7) tension spring with its fingers; (8) needle valve of the dash pot with its port as means for preventing the governor from over-running in the device of defendant. [Record, Vol. 2, page 414, Q. 463.]

If Mr. Henry is correct, then *all* these parts must be included under the term "returning device" if it is to be applied to any of the mechanism used by defendant.

In answer to Q. 88 [Record, Vol. 1, page 135, lines 12-16], Mr. Henry points out on Complainant's Exhibit E, Cottonwood Plant, as equivalents of the "returning device," (1) rod connection K, links and piston rod L and refers to the "clutch" forming part of said "returning device" as the part M.

In answer to Q. 140 [Record, Vol. 1, page 218, lines 10-13], Mr. Henry points out the "returning device" (on Division Creek Exhibits H, I, J, K, and L), as XX and UU and finds equivalent of the clutch at ZZ.

(Note: X-X are rod connections pointed out on Exhibit ZZ as a mechanical circuit.) In the last three lines on page 219 Mr. Henry *adds* the valve YY to the parts he has previously pointed out as the equivalents of the "returning device" stating that it is the "clutch" ZZ with its automatically controlled valve YY which returns the controller to inoperative position so as to prevent excessive movement of the governor.

Subsequently Mr. Henry marks on Complainant's Exhibit ZZ (1) the rack, (2) pinion, and (3) apparently the rod to which the pinion is secured as the mechanical equivalent of the "returning device" indicated at the same time by encircling with a red pencil the mechanism for controlling the opening of the valve permitting the flow of liquid from one side of the piston to the other as the "clutch connection" of said "returning device" [See Record, Vol. 1, page 332, Q. 258, *et seq.*]

(Note: *It should be noted that Henry has omitted from this designation "each of the rod and lever connections to the water gate operating shaft" pointed*

*out by him as means for preventing the governor from overrunning.* [Record, Vol. 2, page 414, Ans. to Q. 463.]

In answer to Q. 258 [Record, Vol. 1, page 332] Mr. Henry shifts his position. First he has pointed out distinctly a means for varying the flow of liquid from one side of the cylinder to another as the "clutch" of the "returning device." Then in answer to this Q. 258 he encircles in red the alleged equivalent of this "clutch." Next, in answer to Q. 259 Mr. Henry shifts from the valve controlling means which he has encircling in red on Exhibit ZZ to the dash pot, *and he has stated distinctly that this dash pot is the clutch.*

IN ANSWER TO Q. 264, PAGE 334, HE DISTINCTLY STATES IN CONTRADICTION OF HIS FORMER TESTIMONY, THAT THE (1) PISTON, (2) PISTON ROD, (3) CYLINDER WITHIN WHICH THE PISTON OPERATES, (4) BODY OF FLUID CONTAINED THEREIN IS THE EQUIVALENT OF THE "CLUTCH CONNECTION" OF THE "RETURNING DEVICE."

*In his answers to Q. 266, Mr. Henry uses the part encircled with a red pencil on Exhibit ZZ as theretofore pointed out distinctly as the "clutch" and so marked on Exhibit ZZ as "means actuated by said controller on movement thereof from normal position to engage said clutch with such shaft" (magnet 32).*

In answer to Q. 273-4, Mr. Henry refers again to the marking on complainant's ZZ as indicating the "returning device."

In answer to Q. 276, Mr. Henry points out "a clutch adapted to bring said returning device into operative connection with the water-gate-operating shaft" as the

element marked on Exhibit ZZ “means actuated by said controller.”

Mr. Henry testifies in effect that in defendant’s device the part encircled by red pencil on Exhibit ZZ must not only be *the equivalent of the “clutch,”* but also is *the equivalent of the magnets 32 and its connections described as “means actuated by said controller, \* \* \*.”*

*Appellant’s witness, Prof. Cory, has contradicted himself and has contradicted complainant Henry in his endeavor to point out in defendant’s device the mechanical equivalent of the returning device, rod 25 of the Lyndon patent in suit.*

In answer to Q. 237 [Record, Vol. 2, page 434, lines 5, *et seq.*], Prof. Cory points out the automatically controlled dash pot as the “returning device.”

In answer to Q. 328 [Record, Vol. 2, page 461] Prof. Cory points out the elements in defendant’s device which he considers as mechanical equivalents of “returning device” for said “controller” within the meaning of claim 3. As here pointed out they are: (1) dash pot E on Exhibit KKK, (2) mechanical parts connected therewith, (3) *especially the rack marked on Exhibit KKK. F.*

*Prof. Cory points out in defendant’s device as the alleged equivalent of the “clutch connection” of said “returning device” the part marked with the letter e of blue print KKK. [Record, Vol. 2, pages 461-464, Q. 328-342.]*

PROF. CORY ON REBUTTAL COMPLETELY CONTRADICTS HIMSELF (AND ALSO CONTRADICTS HENRY) IN HIS AT-



TEMPT TO POINT OUT A "CLUTCH CONNECTION" OF THE "RETURNING DEVICE."

In his answers to Q. 878-883, Prof. Cory confuses clutch connection of claim 3 with the reversing gear. [Record, Vol. 7, pages 2407-11.] On redirect he changes his testimony. [Record, Vol. 7, pages 2419-2421, RDQ. 901-904.] But see his further testimony on recross-examination, particularly answers to RXQ. 925-954, pages 2427-2448; RXQ. 957-967, pages 2450-5; RXQ. 971-2, page 2457.

*The question before the court is whether there is found in defendant's device the rod like that illustrated at 25 of the patent in suit centered by springs connected at one end with the disk of a clutch.*

Defendant's expert, Edward S. Cobb, says, in answer to Q. 109:

" 'A returning device for said controller' is not found in connection with the controller responsive to changes of speed CC, because the positions of the parts of CC assumed for any given speed remain the same, while the speed remains the same, and there is no return until the speed has changed, and hence I do not find the returning device for said controller." [Record, Vol. 2, page 653.]

See also Record, page 655:

"There is no returning device in the speed-measuring device CC in Exhibit J and CC in Exhibit H which returns to a former position by any other means than a change of speed."

See also page 656:

“There is no similarity whatever in the mechanism shown in the exhibits and the mechanism described in the patent either with regard to the means employed or principles of operation, and they are neither one the mechanical equivalent of the other, both showing an entirely distinct and different method of controlling the gates of the water-wheel in conjunction with the control of the gate of the valves in the by-pass from the penstock carrying water to said water-wheel.”

Defendant's expert, S. L. Berry, states that in defendant's device there is not any “returning device for said controller provided with actuating means controlled by said controlling means to return the controller to inoperative position so as to prevent excessive movement of the governor.” [Answer to Q. 218, Vol. 3, page 1085.] See also Mr. Berry's answer to Q. 217; also Q. 1391-1397, pages 1435-1436; answer to Q. 211, pages 1074-77.

### Claims 6 and 7.

It is appellant's contention that these claims are so broad in their terms that they may be read upon defendant's device. That these claims are not to be construed in the light of the Lyndon specification and disclosure. That these claims are not by law limited to a combination of devices for the specified purpose which co-operate in the same manner and under the same principle of operation to produce substantially the same result in substantially the same way as the devices shown and described in the patent, but

cover *any and all means* for accomplishing such result so long as the words of the claims can in some manner be applied to the device sought to be covered by such claims.

That the claims are broad enough, considered apart from the Lyndon specification, to include defendant's device, does not conclusively show infringement.

Westinghouse v. Boyden Power Brake Co., 170 U. S. 537;

Lovell v. Seybold Machine Co., 169 Fed. 288, 290;

Edison v. American Mutoscope & Biograph Co., 151 Fed. 767, 773.

As said by the court in General Electric Co. v. Allis-Chalmers Co., 171 Fed. 666, at 669:

"The fact, however, that defendant's device may be within the language of the claim does not of itself prove that it is an infringement. Infringement is not a mere matter of words."

Goodyear Shoe Mchy Co. v. Spalding, 101 Fed. 990, 994.

As said by the Supreme Court in the Westinghouse case (*supra*):

"The patentee may bring the defendant within the letter of his claims, but if the latter has so far changed the principle of the device that the claims of the patent, literally construed, have ceased to represent his actual invention, he is as little subject to be adjudged an infringer as one who has violated the letter of a statute has to be convicted when he has done nothing in conflict with its spirit and intent."

The Lyndon patent is not entitled to every possible kind of means that might be suggested for operating the water gate in either direction. To construe the patent so broadly would be tantamount to granting Lyndon a monopoly on a function and on a result rather than means for performing that function or accomplishing that result. Such a patent or claim would be void.

Plunger Elevator Co. v. Standard Elevator Co.,  
153 Fed. 747;

Corrington *et al.* v. Westinghouse Air Brake  
Co., 173 Fed. 69, 78.

Weed Chain Tire Grip Co. *et al.* v. Excelsior  
Supply Co., 179 Fed. 232;

Continental Automobile Co. v. A. G. Spalding  
and Bros., 177 Fed. 693;

Arnold v. Tyden, 193 Fed. 410 (summarizing  
holding in the paper bag case, 210 U. S. 405);

Hildredth v. Lauer & Sutter Co., 204 Fed.  
792;

Monash Younkes Co. v. National Steam Specialty  
Co., 208 Fed. 559;

If Lyndon's claims 6 and 7 are construed as covering any and all means for accomplishing the result of operating the by-pass valve inversely to the operation of the water gate the claims are void as attempting to cover a function.

Drum v. Turner, 209 Fed. 854-856;

Eastern Dynamite Co. v. Eastern Powder Mfg.  
Co., 164 Fed. 47-58;

Queen & Co. v. Friedlander & Co. *et al.*, 149  
Fed. 771.



The specific means illustrated in the Lyndon drawings and described in his specification *must be read into his claims* in order to avoid the necessity of construing them as functional and void.

General Sub-construction Co. v. Netcher, 167 Fed. 549.

The Lyndon claims should be strictly and narrowly construed because the Lyndon device has never gone into use.

National Malleable Casting Co. v. Buckeye Malleable Iron & Coupler Co., 171 Fed. 847-853;

Westinghouse Electric & Mfg. Co. v. Toledo P. C. and L. Ry. Co., 172 Fed. 371;

Kestner Evaporator Co. v. American Evaporator Co., 182 Fed. 844.

The *impracticability* of the Lyndon structure (even if we assume for the purpose of argument that the device is operative) would be sufficient to require a strict and literal construction.

In *Wilson Trolley Catcher Co. v. Frank Ridlin Co.*, 173 Fed. 308, a broad claim based upon an *impracticable, though operative structure* construed and held either to be so broad as to be invalid or limited to *substantially the construction shown and described*.

Severy Process Co. *et al.* v. Harper & Bros., 113 Fed. 581.

A patented device never used in an art should not be allowed to dominate the art.

Stromberg Motor Device Co. v. Parker, 204 Fed. 462;

Boston Woven Hose & Rubber Co. v. Pen Rubber Co., 164 Fed. 557.

Where the circumstances of the case require such a construction, courts do not hesitate to limit a patentee, *not only to the exact means described in the specification and illustrated in the drawing, but to the precise form of those means.*

Singer Mfg. Co. v. Crammer, 192 U. S. 265.

To be the mechanical equivalent of Lyndon's means for operating the water gate in either direction, defendant's mechanism *must not only produce an analogous result, but must do so in substantially the same manner and by substantially the same means.*

Imperial Bottle Cap and Machine Co. v. Crown Cork & Seal Co., 139 Fed. 312.

The important elements in the Lyndon device which come within the description of "means for operating the water gate in either direction" are the gear wheels 9, 10 and 11 and the sleeve 13 which in many of the other claims of the patent has been referred to as "*reversing clutch gear.*"

We have shown that neither such reversing clutch gear, nor its mechanical equivalent, is found in defendant's device.

We have shown that construing the patent in the light of the specification and drawings, there is no driving shaft in defendant's device.

*Both driving shaft and reversing clutch gear constitute very vital elements composing "means for operating the water gate in either direction," and there are no such elements to be found in defendant's device.*

There is no "By-pass valve" or its equivalent in defendant's device. Complainant admits this contention by insisting that the plug cock valve of the Bakersfield device is not the equivalent of Lyndon's butterfly valve.

As a matter of fact the butterfly valve of Lyndon resembles the plug cock valve of Bakersfield to a much greater degree than Lyndon's valve resembles the needle valve of defendant's device. Both butterfly valve and plug cock valve are rotating valves. It is obvious that a butterfly valve could be substituted in the Bakersfield installation with very slight changes of form of the casing. Butterfly valves were very old and well known prior to Lyndon's invention.

See testimony of S. L. Berry, Record, Vol. 3, page 990, Q. 116-118; E. S. Cobb, Record, Vol. 3, page 882, Q. 828-830.

Radical changes would have to be made in the form of the Lyndon by-pass and main water gate to permit the use of needle nozzles. The changes would amount substantially to reorganization and rearrangement amounting to new invention.

Not only must the form of the main gate and by-pass valve be changed to permit the use of needle nozzles, *but the whole chain of operating devices must be substituted.*

The reciprocating motion of the needle of the “auxiliary relief nozzle” of defendant’s device is different from the rotary motion of the Lyndon valve.

The plug cock valve of the Bakersfield device and Lyndon patent are what are known as balanced valves, while the needle of defendant’s device does not come within the description of a balanced valve. Its valve principle is different.

Cobb, in his report, defendant’s exhibit Cobb and Hesselmyer report of August 8, 1896, at line 11, page 5, refers to the by-pass valve of the Bakersfield device as “balanced valve.” See also testimony of appellant’s witness, W. W. Wilson, Record, Vol. 6, pages 2265-2272, XQ. 199-214.

### French Patent.

If the Lyndon claims are not limited to an *electro-MECHANICAL* device, substantially as shown and described in the Lyndon specification and drawings, Defendant’s Exhibit French Patent is a complete anticipation of the Lyndon patent in suit.

The device of this exhibit is explained by defendant’s witnesses Edward S. Cobb [Record, Vol. 2, page 621, Q. 83-88] and S. L. Berry [Record, Vol. 3, page 956, Q. 64-69].

The purposes, functions and results of both the device of the Lyndon patent and that of Defendant’s Exhibit French Patent are identical. [Testimony of E. S. Cobb, Record, Vol. 2, page 627, Q. 86-87.]

Claims 6 and 7 of the Lyndon patent read literally on Defendant’s Exhibit French Patent. See testi-



mony E. S. Cobb, Record, Vol. 2, pages 626-8, Q. 86-87, and S. L. Berry, Record, Vol. 3, pages 963-967, Q. 68-69.

### Swiss Patent.

If the Lyndon claims are not limited to an *electro-mechanical* device, substantially as shown and described in the Lyndon specification and drawings, Defendant's Exhibit Swiss Patent is a complete anticipation of the Lyndon patent in suit.

Defendant's witnesses explain said Swiss patent. See testimony of E. S. Cobb, pages 629-632, Q. 88-89, and S. L. Berry, Record, Vol. 3, pages 949-952, Q. 57-58.

Defendant's witnesses compare the disclosure of said Swiss patent with Lyndon's patent. See Record, Vol. 2, pages 638-642, Q. 95-98, and Vol. 3, pages 952-955, Q. 59-63.

Claims 6 and 7 of the Lyndon patent read literally on Defendant's Exhibit Swiss Patent. Testimony of E. S. Cobb, pages 639-641, Q. 96-97, and S. L. Berry, pages 953-956, Q. 63.

### The Bakersfield Device.

Unless complainant is limited to the specific form of device illustrated in his drawings and described in his specification, claims 6 and 7 of the Lyndon patent are void.

They are clearly anticipated by a water wheel governor publicly used at the plant of the Power Development Company near Bakersfield in 1896 and 1897 and subsequently thereto. See testimony of Edward S. Cobb, Record, Vol. 2, page 557; pages 568-593, Q. 18-

58; pages 599-606, Q. 63-73; pages 632-637, Q. 90-94; testimony S. L. Berry, Record, Vol. 3, pages 967-972, Q. 70-80; pages 1001-1002, Q. 136-140; testimony of B. C. Van Emon, Record Vol. 4, pages 1247-1299; testimony of J. A. Lighthipe, Record, Vol. 4, pages 1509-1539.

See defendant's exhibit, "Journal of Electricity, Vols. 4 & 5," in which appears under date of August, 1897, a full description with illustrations of this Bakersfield installation. This exhibit is proven by testimony of Peter H. Ducker, Record, Vol. 3, pages 893-6; E. B. Strong, Record, Vol. 3, pages 934-938, and S. L. Berry, Record, Vol. 3, pages 995-1000, Q. 123-135.

*The Bakersfield governor was a highly efficient governor and performed the functions of its design in a most satisfactory manner.*

E. S. Cobb, Record, Vol. 2, page 583, Q. 33; page 600, answer to Q. 64; page 612, next last sentence in answer to Q. 76; page 728, Q. 301; page 745, Q. 352; and page 823 where appears the following:

"Q. 630. Well, if you were asked to set up a water-wheel governor or governing mechanism combining a water-gate with a by-pass valve and a governor *per se*, so inter-related that the by-pass valve operated inversely to the operation of the water-gate, you would be able to lay that out on the board?

A. I think so, and if I wanted to point to a design of that character which I know was successful in operation and which was never excelled as a water-wheel governor, I would point you to the design shown in the plant of the Power Development Company at Bakers-

field as it was originally laid out, in its principles of construction and operation.”

Defendant's expert, S. L. Berry, testifies:

“Q. 26. State whether or not the device which you have mentioned as having been designed in 1896 for use at Bakersfield employed a speed-governor, and, if so, describe it briefly.

A. The mechanism designed for use at Bakersfield was operated by a governor which responded to load and speed changes. It was in effect a transmitting dynamometer which took a definite position in response to a definite load. This position was modified slightly by any speed variation which occurred. The by-pass valve was an extremely necessary part of the equipment, inasmuch as the rapidity of action of this governor made its operation impossible without the by-pass feature. It was at that time very much quicker in action than any governor on the market. It was a result of this quickness which led to the development of the by-pass mentioned. The first installation of this by-pass was put on as a second thought when the governor proved so rapid in action that the inertia effects rendered governing out of question. It was a complete remedy for an intolerable condition.” [Record, Vol. 3, page 908.]

“The object and result of this construction was to enable a prompt and accurate governing of the amount of power on the wheels, without the disturbance of flow or pressure in the main conduit. This object was fully attained by the plant under discussion. The parts were so adjusted that when the water-wheel gates were

fully opened the by-pass valve was fully closed, and *vice versa*.

Q. 111. As a governing mechanism, state whether or not the device which you have described attained the object and result aimed at by its designers.

A. The mechanism as installed near Bakersfield attained in the most complete and satisfactory manner the governing action aimed at and exceeded by considerable margin the guaranties made in that connection.

Q. 112. By Mr. Westall: After the first installation, state whether or not any changes in construction or adjustment of the different parts were made, and, if so, state the nature and extent of any changes which were made in the governing device as originally designed and installed.

Q. 113. By Mr. Westall: The question is withdrawn. State whether to your knowledge any changes in adjustment or construction of the different parts were made after the first installation of the device about which you have testified.

A. The only changes made in this mechanism within my personal knowledge resulted from the non-realization of very positive statements to us that the water of the Kern River at that point was entirely clear of grit or other foreign matter. This assurance to us was of such a nature that we felt justified in operating the balanced valve and hydraulic cylinder from the conduit line. After trial it developed that this water was far from free from such foreign matter, and it became necessary to substitute oil under pressure to the balanced valve 24 and cylinder 25. This was done by



driving a forcepump from the water-wheel shaft 8, supplying oil under pressure to the valve 24 and cylinder 25. This same condition of contained grit or sand rendered the operation of the by-pass valve 41, as originally constructed, somewhat difficult. This trouble was remedied by me at the plant by adding to the end of the moving portion 41 of the by-pass valve a support on the center thereof to sustain in part the weight of the said moving portion 41. This change completely obviated any difficulty in this by-pass valve during the time I remained at the plant. A device of this nature if exposed to the flow of water containing sand or grit must necessarily wear, as do all hard substances exposed in like manner. The remedy in this case under conditions involving gritty water would be to make the moving portion 41 somewhat smaller than the bore of the containing portion 43. This condition is one which could be provided by the original manufacturer, and is one which will naturally produce itself in operation.” [Record, Vol. 3, pages 987-989.]

On cross-examination Mr. Berry testifies:

“Q. 572. You know, do you not, that that combination as installed at the Power Development Company plant in Bakersfield or near Bakersfield was wholly inoperative, and that it never did successfully work, and that the Girard wheel installation including the by-pass was taken out, discarded and sold as junk, within two months after it was received and set up at the point of installation?

A. In answer to part of the question, I know nothing of the kind. In fact the plant operated with ex-

treme satisfaction as to governing, as to the by-pass action. The sole reason why this machinery was discarded was on account of the low efficiency of the Girard wheel.” [Record, Vol. 3, pages 1188-89.]

On redirect:

“A. The governor and by-pass as installed by the Girard Water Wheel Company for the Power Development Company at Kern River performed their functions completely and satisfactorily. There was never any question to my knowledge as to the highly satisfactory nature of the governing. The fact that the governor was continued in use after the removal of the Girard wheels on account of low efficiency would show the highly satisfactory nature of this service, and the fact that the by-pass valve may have been removed at that time, or was not used after that time, does not come into the question at all for the simple and very strong reason that the Tuthill wheels which immediately succeeded the Girard wheels in this plant did not require and could not use a by-pass valve located as this one was originally, for the reason that the deflecting plates used on that wheel performed this function.” [Record, Vol. 4, pages 1443-1444.]

See also testimony of B. C. Van Emon, Record, Vol. 4, page 1274, Q. 130-134; pages 1283-1285, Q. 201-209. J. C. Lighthipe testifies:

“There were no changes made in the governor. The governor gave perfect satisfaction and governing remarkably well up to the capacity of the water-wheel.” [Record, Vol. 4, page 1513, Q. 17.]

See also testimony of complainant's witness Chas. B. Sessions, Record, Vol. 5, pages 1724-25, Q. 79-83. Complainant's witness Carroll N. Beal testifies:

"RXQ. 75. And the main reason for discarding the Girard wheel was that it would not give the power?

A. The Girard wheel would not give the power; that was the main reason. And in the low outputs regulated. In the higher outputs of its capacity it did not regulate. *I want to say this, as I recall the thing, and that is, that owing to the inability of both the Girard wheel and the Tuthill wheel to give the necessary required output, the governing system of those was not tried out as thoroughly as it otherwise would have been.*

RXQ. 76. By Mr. Westall: That is the Girard and Tuthill?

A. Both. *The fine governing features were not tried out as they would have been tried out had the power output been there.*

RXQ. 77. So that the failures of the wheels to give the required efficiency was the main and primary cause of their being discarded?

A. If you don't get the power it don't make any difference how well they are regulated. Power was the primary *sine qua non*. Regulation was to follow." [Record, Vol. 5, page 1740.]

Unquestionably this governor was a complete success and completely and satisfactorily performed its functions. It was taken out,—*not because of any inefficiency of such governor*,—but because the Girard water wheels were removed. But the governor was a

complete success and this was a successful prior use of such governor. There is no evidence upon which to base a finding that this governor was discarded or abandoned *because it failed*. Appellant's assertion to such effect is wholly unwarranted.

It is not true that the governor and by-pass mechanism installed by the Power Development Co. in 1896 and 1897 at Bakersfield was a mere experimental use and abandoned experiment.

*The evidence is very clear that identically the same device was thoroughly tested and tried out and successfully used several years before the Bakersfield installation.* [See testimony of S. L. Berry, Record, Vol. 3, pages 1065-1068, Q. 201-205; pages 1184-1188; Q. 556-570; B. C. Van Emon, Record, Vol. 4, pages 1275-1278, Q. 141-156; pages 1285-1295, Q. 212-264; S. L. Berry, Record, Vol. 4, pages 1341-1345, Q. 1001-1013; page 1385, Q. 1198; page 1417, Q. 1314; page 1452, Q. 1414.]

The testimony of Mr. Dearth, the witness upon whom complainant seems to place most reliance in the attempt to show that the Bakersfield governor was not successfully used, *corroborates in a large part the testimony of Cobb, Berry, Van Emon, Lighthipe, Beal and Sessions as to the reasons why the use of the governing apparatus in question was not continued. The failure of the Girard wheels to develop the required efficiency was the cause of their removal.* [See Record, Vol. 5, pages 1675-1676, XQ. 302-306.]

Mr. Dearth testifies:



“XQ. 374. The reason the Girard wheel was taken out was because it did not develop the required horsepower?”

A. *Yes, sir; that is the reason.*

XQ. 375. By Mr. Westall: And it is also true that when the new wheel was put in it had a method of governing which did not require the use of a by-pass. Is that true?

A. When the Tuthill wheel was put in; yes, sir.” [Record, Vol. 5, page 1694.]

“Q. 119. How did the generators operate when driven by the Girard wheels, with respect to efficiency?

A. The best efficiency of a generator is its normal load. We never could deliver to exceed, if my recollection serves me right, about 40%, or, possibly, 50%, of the real load of the machine.

Q. 120. What do you lay that to?

A. *Inefficiency of the water-wheel. It could not deliver the goods.*

Q. 121. You mean 40% efficiency from one of the wheels?

A. Well, give it the advantage of all there is and say 50%.

Q. 122. From one of the wheels?

A. From one of the wheels. My recollection is that it was less than that. I know it was a very great disappointment.” [Record, Vol. 5, page 1650.]

“Q. 154. What was used for governing the flow of water to these Tuthill wheels?

A. The same device up to the hydraulic engine; beyond that there was a different device on the water-wheel.

Q. 155. What was the nature of that device?

A. It was in the nature of a baffle-plate shut over the nozzle.

Q. 156. How were those baffle-plates operated?

A. By this hydraulic engine.

Q. 157. Were they at any time hand operated?

A. Oh, yes.

Q. 158. Was any by-pass or relief device used on the pipe-line in connection with these Tuthill wheels?

A. No; it was not necessary.

Q. 159. Why?

A. The water was not shut off in any sense of the word, but just deflected from the wheel.

Q. 160. In other words, if I am correct, the flow of water to the wheels was not changed in volume?

A. Not at all." [Record, Vol. 5, pages 1654-1655.]

B. C. Van Emon, a manufacturer of elevators at San Francisco and totally disinterested in this case, testifies on cross-examination by appellant's counsel:

"Q. 69. What part of the Girard wheels was it that to your mind was deficient in proper action?

A. The nozzles and also the wheel.

Q. 70. You know that those wheels and the by-pass valve were taken out of that plant very soon after they were put in there, do you not?

A. No; they were not.

Q. 71. Are you sure of that?

A. Yes.

Q. 72. How long do you think they were in there?

A. They were in there some little time after the Girard wheels were taken out.

Q. 73. What was in there?

A. The by-pass and governing mechanism.

Q. 74. Do you mean the by-pass valve or the casing of the by-pass valve which you referred to yesterday?

A. The valve and casing.

Q. 75. Do you know that the opening from the by-pass valve casing to the tailrace was sealed up in not many months after the Girard wheels were first attempted to be operated?

A. No, sir; they were not.

Q. 76. Are you sure it was not sealed up?

A. Sure. I had absolute charge of the whole proposition." [Record, Vol. 4, pages 1265-1266.]

S. L. Berry testifies:

"There was never any question to my knowledge as to the highly satisfactory nature of the governor," etc. [Record, Vol. 4, page 1444.]

Claims 6 and 7 of the patent in suit read literally upon this Bakersfield governor. See testimony of E. S. Cobb, Record, Vol. 2, pages 606-612, Q. 74-76; testimony of S. L. Berry, Record, Vol. 3, pages 992-995, Q. 121-122.

There is a much closer correspondence both in mechanical parts, interrelation of parts, and principles of action or mode of co-operation of the parts or elements of this Bakersfield governor and of defendant's governors, than there is between the device of the Lyndon patent in suit and the defendant's devices. Defendant's governors and the Bakersfield governor are purely mechanical and *not electromechanical*.

The Lyndon invention was not copied by either the Bakersfield installation nor by defendant. The Lyndon invention was a mere paper theory. It never came into actual existence. The art in no wise is indebted to Mr. Lyndon. Defendant's governor was an independent invention,—operating upon a distinct and independent principle and with a mode of operation distinct from that dreamed of by Mr. Lyndon. Mr. Lyndon's conception was the use of electric devices. His dynamo 8 was an important feature which to a great degree characterized his theory. His governor was not conceived with the idea of water economy. It depended upon a normally half-open by-pass. Without total reconstruction his theory could not be operated for water economy or with a normally closed by-pass.

The Bakersfield by-pass valve and gates were operated by a hydraulic cylinder in a manner very similar to that of defendant. The liquid actuating said hydraulic cylinder was controlled by a line to line valve bearing a close resemblance to that of defendant. In the Bakersfield device the centrifugal force of revolving weights form the speed sensitive element thus resembling defendant's fly balls. The by-pass valve and the main gates of this Bakersfield device were connected solidly together so as to work synchronously, the operation closely resembling that of defendant.

*This Bakersfield governor achieved the general results and objects of the Lyndon patent much more closely than does the device of the defendant. The Bakersfield device effected governing without regard to water economy, there being a constant waste of water*



through the half open by-pass under normal conditions of load and speed, closely resembling that of the Lyndon patent. The by-pass valve of Bakersfield installation shows a by-pass in the same sense as the Lyndon by-pass, *in that it operates inversely to the water-gate in both directions and at all times, its normal position being like that of Lyndon a half open position and not closed like defendant's device.*

It is not a sufficient answer to the disclosure of the Bakersfield device, that the Bakersfield governor *also acted as a load governor.*

*While a device may be equivalent if it does more, it can never be an equivalent if it does less.*

Engle Sanitary & Cremation Co. v. City of Ellwood, 73 Fed. 484, bottom of page 485-486.

The Bakersfield device accomplishes all that Lyndon sought to accomplish and more. It acted as a speed sensitive device as well as a load sensitive device. There is no result sought by Lyndon which was desirable which was not actually accomplished by said Bakersfield device. [See testimony of E. S. Cobb, Record, Vol. 2, page 593, Q. 58.]

Defendant does not contend that the Lyndon patent in suit is anticipated by Bakersfield, although the Bakersfield installation was pleaded as an anticipation in the answer of defendant, because,

(1) Under what we submit is the proper construction of the Lyndon claims, said claims must be confined to an *electromechanical* water-wheel governor, and the Bakersfield device is a purely mechanical governor. (*So also is defendant's governor.*)

(2) *We submit that the rule in Westinghouse v. Boyden* (170 U. S. 537) is properly applicable, because,

(a) While the letter of the claims may be read on the Bakersfield governor, the spirit cannot be so read. If construed as appellant seeks to construe these claims they are clearly anticipated by this Bakersfield installation. But construed in the light of and limited to the principle and mode of operation of the particular elements and correlation thereof shown and described by Mr. Lyndon these claims can be sustained, but when so construed it is equally clear defendant does not infringe.

### By-Pass.

In defendant's device there is no "by-pass" for the water wheel within the sense of the Lyndon claims 6 and 7, or of Lyndon's theory. Lyndon clearly describes a device in which the by-pass valve is intended to be normally in a half open position, and is used to maintain a constant flow of water in the pipe line.

In defendant's device the auxiliary relief nozzle is *not normally in a half open position, but is normally closed or nearly so*, and its purpose is not to maintain a constant flow of water in the pipe line, but to protect the pipe line against extreme pressures. [See testimony of Mr. Henry, Record, Vol. 1, pages 349, 350, Q. 299; page 352, Q. 300; testimony of E. F. Scattergood, Record, Vol. 1, page 161, Q. 20-46; page 175, Q. 59-65; testimony of C. A. Heinze, Record, Vol. 1, pages 182-183, Q. 25-27; page 184, Q. 33.]

In defendant's device there is no "means connected to the water-gate-operating means and operating the by-pass valve inversely to the operation of the water-gate" as called for by claim 6, nor the "means connected to the water-gate-operating means and adapted to operate the by-pass valve from normal position in either direction", so as to control such valve inversely to the control of the water-gate, during the governing action of the water-gate, as called for by claim 7. Unless the means described are confined strictly to the device shown and disclosed in the Lyndon drawings for effecting the results sought, the claims as to this element are void as functional. The authorities heretofore cited with reference to the first element of each of the claims 6 and 7 are applicable.

If Lyndon's claims 6 and 7 are construed as covering *any and all means* for accomplishing the result of operating the by-pass valve inversely to the operation of the water-gate the claims are void as attempting to cover a function.

Drum v. Turner, 209 Fed. 854-856;

Eastern Dynamite Co. v. Eastern Powder Mfg. Co., 164 Fed. 47-58;

Queen & Co. v. Friedlander & Co., 149 Fed. 771.

The rule established in the United States Patent Office, by repeated decision of the Commissioner of Patents, shows the interpretation placed upon the Lyndon claims by the Patent Office while the Lyndon application was before it. Such rule is useful in determining the interpretation placed upon such claims *by the parties* at the time the patent contract was

negotiated. This rule may be illustrated by the decisions of the commissioner in the following cases:

*In re Bullock*, 127 O. G. 1580:

“Where the claim is not a combination of which the ‘means’ for the purpose mentioned is an element, but is merely for means as an element and covers all possible means for accomplishing a certain function regardless of structure, held: that the claim is indefinite and functional.”

*In re Gardener*, 140 O. G. 258, it was held that:

“It is well settled law that a patent cannot issue for a result sought to be accomplished by the inventor of a machine, but only for the mechanical means of instrumentalities by which that result is to be obtained. One cannot describe a machine which will perform a certain function itself and all other machines that may be invented by others to perform the same function.”

In *Woodward* 19 Gour. 73-20, (Sept. 1907) the commissioner held:

“Claims in which the only thing positively claimed is ‘means for straightening and holding the cross bars in the position stated are vague and indefinite since they attempt to cover all possible means for performing a certain function without any structural qualification as to character of the means’.”

*The specific means illustrated in the Lyndon drawings and described in his specification should be read into his claims in order to avoid the necessity of construing them as functional.*



General Sub-construction Co. v. Netcher, 167  
Fed. 549.

All that has been said about the necessity for a strict construction, owing to the impracticability of the Lyndon device, the fact that it has never gone into commercial use; that no single specimen of the device has ever been made; and that the state of the art requires an extremely literal construction reading into the claims the precise means disclosed, applies with equal force to the means for operating the by-pass valve.

### **Means for Returning the By-Pass Valve.**

In defendant's device there is no "means for returning the by-pass valve to normal position on completion of the governing movement of the water-gate-operating means".

Lyndon is not entitled to every possible kind of means that might be suggested for operating the water-gate in either direction. To construe the patent so broadly would be tantamount to granting Lyndon a monopoly on a function on the result rather than the means for performing that function or accomplishing that result in the manner and according to the principle suggested by him.

Plunger Elevator Co. v. Standard Elevator Co.,  
153 Fed. 747;  
Corrington *et al.* v. Westinghouse Air Brake  
Co., 173 Fed. 69-78.

As said by the court in Weed Chain Tire Grip Co.  
v. Excelsior Supply Co., 170 Fed. 232, at page 234:

“To the objection that the claims are functional, it may be said that claims for means for, or mechanism adapted to a certain result, and, like functional claims, are not objectionable *if limited to the invention shown by the specification and drawings. So narrowed* they are valid. Hobbs v. Beach, 180 U. S. 383; Paper Bag Case, 210 U. S. 405.”  
(Italics ours.)

See also,

Continental Automobile Co. v. A. G. Spaulding & Bros., 177 Fed. 693;

Hildreth v. Lauer & Sutter Co., 204 Fed. 792;

Monash Younkes Co. v. National Steam Specialty Co., 208 Fed. 559.

If claim 7 of the patent in suit is construed as embracing any and all means for accomplishing the result of returning the by-pass valve to normal position, the claim is void as covering a mere function. Such claim must be restricted to the devices shown and described by Lyndon, or to their mechanical equivalents. To be equivalents the substituted devices must perform the same function as the respective devices for which each is substituted and perform that function in substantially the same manner. The mode of operation must not be changed. The correlation of the parts must not be varied. *The idea of means* must not be departed from.

Robinson on Patents, Sec. 893, Vol. III.

As said by the court in American Pin Co. v. Oakville Co., 3 Blatchf. 190, Fed. Cas. 313:

“The rules thus laid down must govern this case. The patent does not secure to the patentee the result or effect produced, but only the means described by which the result or effect is produced. The means which he specifies to produce the result or effect are secured, and nothing more. *And all other means to produce the same result or effect, and not patented to any one, are open to the public.*” (Italics ours.)

The specific means illustrated in the Lyndon patent drawings and described in his specification should be read into the claims to avoid the necessity of holding them void as functional. Furthermore, such claims must be strictly construed because the Lyndon theory has never gone into use. The Lyndon invention never passed from mere theory to practical use. The *impracticability* of the Lyndon structure (even if we assume for the purpose of argument that the device is operative) would be sufficient to require a strict and literal construction, because, in

Wilson Trolley Catcher Co. v. Frank Ridlin Co.,  
173 Fed. 308,

*a broad claim based upon an impracticable, though operative structure construed, was held either to be so broad as to be invalid or limited to substantially the construction shown and described.*

See also,

Severy Process Co. et al. v. Harper & Bros., 113  
Fed. 581.

*A patented device never used in an art should not be allowed to dominate the art.*

Stromberg Motor Device Co. v. Parker, 204 Fed. 462;

Boston Woven Hose & Rubber Co. v. Pen Rubber Co., 164 Fed. 557.

*Where the circumstances of the case require such a construction, courts do not hesitate to limit a patentee not only to the exact means described in the specification and illustrated in the drawing, but to the precise form of those means.*

Singer Mfg. Co. v. Crammer, 192 U. S. 265.

To be the mechanical equivalent of Lyndon's means for returning the by-pass valve to normal position, defendant's mechanism must not only produce an analogous result, but must do so in substantially the same manner and by substantially the same means.

Imperial Bottle Cap and Machine Co. v. Crown Cork & Seal Co., 139 Fed. 312.

Mr. Henry is mistaken in pointing out the dash pot and its associated springs as the equivalent of Lyndon's means for returning the by-pass valve to normal position.

See Mr. Henry's testimony, Record, Vol. I, pages 222-3 (last paragraph of page 222).

Even reading a dash pot into the Lyndon devices to ease the descent of the weights (which it must be noted is not claimed as an element of said claim 7), the mechanism does not operate in the same manner as the device pointed out in defendant's structure. The object of the dash pot and springs of defendant's device is to introduce an elastic element between the



operating means and the stem of the auxiliary relief needle, which merely permits a certain slippage between the two parts. Upon a movement of the means operating the main needle of defendant's device, the main needle being rigidly connected thereto will move, *but this result is not necessarily followed by a movement of the relief nozzle needle.* If the movement of the main needle is not too sudden and violent when moved in either direction, or upon a movement of the main needle in an opening direction, the dash pot and springs of defendant's device will merely allow the parts to slip or slide upon one another, *and no inverse motion of the relief nozzle needle will follow.*

In Lyndon's device, once clutch 58-59 is operated by magnet 64, (*which must be effected whenever the main gate of Lyndon's moves*, whether it moves in an opening or closing direction) the by-pass valve will be positively operated and Lyndon's dash pot and weights do not permit any slippage.

In defendant's device the springs of the dash pot and the dash pot mechanism are in operation to prevent movement of the auxiliary needle as well as to cause such needle to move toward its normally closed position at all times, while in Lyndon's device the dash pot and weights permit of no elasticity or movement and can only be operated when the sheave 54 is moved far enough to break contact at 74-75, or when circuit is broken through magnet 64.

*The primary purpose of the dash pot and springs of defendant's device is to permit the main needle to move many times without a corresponding movement of the*

*auxiliary needle and to prevent the auxiliary needle from leaving its closed or nearly closed position, and thus wasting water, while the weights of Lyndon are intended to do exactly the reverse, namely: to open by the by-pass so as to permit a constant waste of water.* [See testimony of appellant's expert, Prof. Cory, Record, Vol. I, page 280, Q. 157-158.]

*Prof. Cory*, (the only other witness besides complainant), who attempted to point out mechanical equivalents between the patent in suit and defendant's device, *exhibits extreme unfamiliarity with the operation of the dash pot and springs of defendant's device, and shows that his testimony cannot be relied upon.* [See Record, Vol. I, pages 279-284, Q. 158-179.]

(Prof. Cory is coached and cross-examined by counsel for complainant in an effort to make him understand the operation of the device.)

### **Lyndon's Attempt to Prove an Earlier Date of Invention Than That of His Application.**

Complainant has endeavored to antedate the French and Swiss patents by proving that Mr. Lyndon invented the subject matter of the Lyndon patent prior to the date of the French and Swiss patents. The burden is upon complainant to prove this fact, and the law is well settled that a mere preponderance of the evidence is not sufficient. On the contrary, such carrying back of the date of invention must be established *by the same high degree of proof that is required to convict one charged with a criminal offense, namely:* BEYOND A REASONABLE DOUBT.

Westinghouse Co. v. Saranac Co., 108 Fed. 222;  
Michigan Cent. R. Co. v. Consolidated C. H.  
Co., 67 Fed. 121, at page 129;  
Wheaton v. Kendall, 85 Fed. 672;  
Dey Time Register Co. v. W. H. Bundy Record-  
ing Co., 178 Fed. 818;  
Eck v. Kutz, 132 Fed. 763;  
Thayer v. Hart, 20 Fed. 693;  
Eagleton Mfg. Co. v. West Bradley & Cary  
Mfg. Co., 2 Fed. Cas. 774, 777;  
20th Century Co. v. Loew Co., 243 Fed. 373;  
Lemly v. Dobson Evans Co., 243 Fed. 391;  
Jackson Co. v. Adler, 243 Fed. 386, 389.

As said by the court in Westinghouse Co. v. Saranac Co. (*supra*):

“The patent being anticipated, if the date of the application be taken as the date of invention, the burden rests upon the complainant to satisfy the court that the invention was made at an earlier date. *There is no presumption in favor of such a patent.* The burden which rested upon the defendant in the first instance has been transferred to the complainant and it must furnish the court with convincing proof that the anticipation has been anticipated.” (*Italics ours.*)

Judge Hawley, in Wheaton v. Keldall (*supra*), quotes with approval from the opinion of Judge Coxe in Thayer v. Hart (*supra*), as follows:

“The evidence of prior invention is usually entirely within the control of the party asserting it, and so wide is the opportunity for deception, artifice, or mistake, that the authorities are almost

unanimous in holding that it must be established by proof clear, positive and unequivocal. Nothing must be left to speculation or conjecture.”

(See 85 Fed., last paragraph, page 672.)

The Court have come to recognize that testimony on behalf of complainants in patent cases which seeks to carry back the date of the invention of the patent in suit so as to antedate a proven defense is to be scrutinized with the same care as is evidence offered by defendant to prove the defense of prior use. The reason is the same. Therefore, the words of the Supreme Court in the Barbed Wire Case, 143 U. S. 275, although spoken directly with reference to evidence of prior use, may be applied equally to the attempt of appellant to antedate the French and Swiss patents. The court says:

“Indeed, the frequency with which the testimony is tortured or fabricated outright to build up the defense of a prior use of the thing patented, goes far to justify the popular impression that the inventor may be treated as the lawful prey of the infringer.”

The litigation over the Perlman demountable rim patent attests to the fraud often perpetrated by this class of testimony. In fact it has become common talk that in no class of litigation is there so much perjury as in patent cases where the patentee seeks to carry the date of completion of his invention back earlier than a prior patent or prior public use. In the Perlman case the patent was sustained in the first case,—by virtue of perjured testimony as to the dates when Perlman



conceived his invention and reduced it to practice. In the next subsequent case the same fraud was attempted but the defendant convinced the trial court that Perlman's testimony was utterly false. Fortunately the showing was sufficiently clear to result in a dismissal of the suit and the indictment of Perlman.

In the case at bar it is not clearly shown that Lyndon had in mind the precise mechanism he afterwards applied for a patent on. The Lyndon device is extremely complicated. It is undoubtedly true that Lyndon had in mind *some imperfect theory*; but it is thought that a consideration of the evidence will show that he had only the germ of an idea not fully developed, and had not conceived fully a complete device prior to the date of either the French or the Swiss patents.

In the case at bar there is no evidence of any actual building of an electromagnetic water-wheel governor by Mr. Lyndon at any time prior to his application for patent. There is no evidence that he ever "*completed*" the invention before his application for patent. There was no reduction to practice by him prior to his application for patent. The caveat filed by him was not a reduction to practice. It does not stand in law as a constructive reduction to practice. Under such circumstances the earliest date to which Mr. Lyndon is entitled is the date of filing of his application.

Automatic Weighing Machine Co. v. Pneumatic Scale Corporation, 166 Fed. 288 (C. C. A., 1st Cir.).

An examination of the claims of the Lyndon patent shows that each of such claims is for a combination

of interrelated elements. Appellant admits that separately considered every element is old and that the invention, if any, resides in the combination.

“If defendant omits one or more of the material elements which make up the combination he no longer uses the combination, and it is no answer to say that the omitted elements are not essential, and that the combination operates as well without as with them. *Leeds & Catlin v. Victor Talking Machine Co.*, 213 U. S. 301; *Evans et al. v. Hall Printing Press Co.*, 223 Fed. 539. It must also be established by one who alleges infringement of a combination that the entire combination as a (in) unitary structure, and having substantially the same mode of operation, is (and of) present (presence) in the alleged infringing machine. *Owens v. Twin City Separator Co.*, 168 Fed. 259. To make one mechanical device the equivalent of another it must appear not only that it produces the same effect, but that such effect is produced by substantially the same mode of operation.”

*Wilson & Willard Mfg. Co. v. Union Tool Co.*,  
Case 2996, decided by this court Feb. 11, 1918,  
—not yet reported.

*The appellant rests his whole case of infringement upon his contention that the court may and will totally ignore the doctrine of equivalency and find infringement from the words of the claims disassociated from the electromagnetic water-wheel governor shown and described by Mr. Lyndon. “He contends that the word means is so broad in its scope that it embraces any mechanism that will accomplish the result claimed for his patent.” (Opinion of Judge Trippet, Record, Vol.*

1, page 63.] “The complainant contends that the Lyndon patent in controversy is a primary and pioneer patent; *that it is so broad in scope and entitled to such broad interpretation that the claims therein may be read upon the structures of the defendant so as to show infringement regardless of the doctrine of equivalents.*” (Opinion of Judge Trippet, Record, page 62, —italics ours.)

Clearly under the evidence in this case, and in view of the theory of operation embodied by Mr. Lyndon in his conception of an electromagnetic water-wheel governor, defendant's device does not contain either *the identical elements* of any claim of the Lyndon patent or *the mechanical equivalents* of any claim thereof. It is for this reason that appellant asserts this novel but absurd proposition and asks the court to stretch the Lyndon patent to cover the function and effect of a water-wheel governor and not to limit such patent to the mechanism invented by Lyndon or the actual equivalents of such mechanism.

In appellant's brief reference is made to the settlement between the appellant and the Pelton Water-Wheel Company. This was a compromise of litigation pending between the parties. This is shown by the agreement entered into. The effect of such a compromise cannot be the same as the recognition of the Lyndon patent and invention and its adoption and use, as showing utility, etc. The litigation between appellant and said Pelton Water-Wheel Company involved many other things besides this Lyndon patent.

During the argument in the District Court appellant

made use of an exhibit which it entitled "*Lyndon compared with infringing structures.*" This chart totally destroyed the charge of infringement. We call Your Honors' particular attention thereto and to the following analysis of the claims of the Lyndon patent, in connection with such chart.

### "Water-Gate-Operating Shaft."

(Claims 3, 4 and 8.)

First, what part is meant by Lyndon when he uses the term "water-gate-operating shaft"? A study of the context of the patent will show that in claims 3 and 4 Lyndon refers to the *shaft 12* as the water-gate-operating shaft. This is clear from the language of claim 3, "a returning device \* \* \* provided with a clutch connection to said operating shaft". The only operating shaft mentioned in the claim is the water-gate-operating shaft, and the clutch connection of the so-called returning device is to the shaft 12. Therefore, the context shows beyond a doubt that Lyndon meant the shaft 12 when he used the term "water-gate-operating shaft." *The precise issue is then: does the rock shaft "A" of complainant's chart perform substantially the same function in substantially the same way and by substantially the same means as the shaft 12 of Lyndon?*

Shaft 12 of Lyndon is a revolving shaft which may positively revolve in both directions. Upon it, and forming a very important part of the mechanism of the Lyndon patent is the clutch connection 22-23, which upon rotation of the shaft throws in operation the alleged returning device, rod 25, and breaks contacts



through the different magnets. Shaft 12 thus performs three functions: (1), it moves the water-gate; (2), it moves the by-pass; (3), it positively actuates the so-called returning device to break contact through the various magnets controlling its own, as well as motion of other elements.

The rock shaft "A" is not the mechanical equivalent of shaft 12 of the Lyndon patent: (1), it is not a revolving shaft in the sense of the Lyndon patent; (2), it does not always move the valve of the relief nozzle when the main needle moves; (because of the intervention of the oil dash pot "I" on said chart which is designed expressly to *prevent* movement of the auxiliary needle except when the movement of the main needle is sudden and excessive, and only when the main needle is moving in a closing direction, the auxiliary needle being previously in its normally closed position); (3), *shaft "A" has no clutch connection operating any returning device—the so-called equivalent of the returning device, namely, the oil dash pot "D" of said chart is not located anywhere near the so-called water-gate-operating shaft "A". Unless all the elements intervening between the so-called water-gate-operating shaft "A" and the dash pot "B" are the equivalent of the clutch connection, disks 22-23 of the Lyndon patent, there is no clutch connection to said operating shaft, and consequently the element "A" does not perform all the functions of the shaft 12 of the Lyndon patent.*

“One thing to be the equivalent of another must perform the same function as that other; and while it can be an equivalent if it does more than that other, it cannot be such equivalent if it does less.”

Engle Sanitary & Cremation Company v. City of Ellwood, 73 Fed. 484, bottom of page 485-486.

*Claim 8:* In this claim the context of the patent clearly shows us that the element described as “the combination with a shaft for operating the water-gate in either direction from normal position” means shaft 20, because in the same claim we find the language “a clutch, adapted to connect said operating device for the by-pass valve *with the water-gate-operating shaft* to control the by-pass valve inversely to the water-gate”: This language could only refer to clutch 57-58, and as this clutch is on shaft 20 no other conclusion seems possible than that Lyndon meant shaft 20 in this instance by the language “a shaft for operating the water-gate in either direction.”

Shaft 20 differs from shaft “A” of said chart in that:—(1), shaft 20 is a revolving shaft while shaft “A” is only a rock shaft; (2), shaft 20 is attached directly to the clutch 57-58 through which it operates the by-pass valve, *while there is no clutch connected to shaft “A” at all*. The mode of operation and means of these two shafts differ radically.

“Means for Operating Same” (Water-Gate-Operating Shaft 12) “in Either Direction to Govern the Water-Wheel”, Claim 3; “A Reversing Clutch-Gear, Adapted to Turn the Water-Gate-Operating Shaft in Either Direction”, Claim 4; “Means for Operating the Water-Gate in Either Direction”, Claims 6 and 7; “Reversing Means for Operating the Water-Gate-Operating Shaft in Either Direction”, Claim 8.

These different quotations indicate the same element in the Lyndon structure, which is pointed out as finding its mechanical equivalent in the cylinder marked “B” of said chart.

The language of all these claims refers to the element known as the reversing clutch gear 9, 10 and 13. The hydraulic cylinder “B” is not a clutch gear; does not come within any of the definitions of a clutch gear; does not perform any of the functions of a clutch gear; cannot be substituted in any mechanism to perform any of the functions of a clutch gear; operates in a manner entirely different from a clutch gear. A hydraulic cylinder and a clutch connection or clutch-gear are about as different in physical appearance, functions, principles of operations and results, as any two simple mechanical elements might be.

Broadly the reversing clutch gear, 9, 10, 13 of the Lyndon patent, connects two shafts so that motion may be imparted from one revolving shaft to another. The hydraulic cylinder of defendant’s device does nothing of the kind.

The function of this clutch gear of the Lyndon patent is to connect the driving shaft 6 with the shaft 12 "in reverse driving relations." Complainant has pointed out the little shaft that rotates the fly balls of defendant's device as the mechanical equivalent of the driving shaft 6. [See marking on complainant's Exhibit Z-Z.] The alleged water-gate-operating shaft "A" of defendant's device is distinct from the alleged equivalent of the driving shaft. These two shafts are not connected in any "reverse driving relations."

The court should not lose sight of the fact that Mr. Henry pointed out not only this cylinder with its piston and piston rod, *but the valve which he has marked controller* on complainant's Exhibit Z-Z, namely, the line to line valve through which is regulated the flow of fluid under pressure to the cylinder "A", and a great many other elements down to the water-gate shaft. [Record, Vol. 1, page 322, Q. 219 *et seq.*]

Nothing could more conclusively show the weak analogy that exists between these elements than Mr. Henry's contradictions. It must also not be forgotten that Mr. Cory finally admits that this cylinder cannot even lead to a result analogous to the clutch gear of Lyndon without the addition of other elements. Even the elements suggested by Mr. Cory do not make the device perform the same functions of the Lyndon clutch gear.

No infringement exists because of the total absence of any equivalent of the reversing clutch gear or equivalent of the means for operating the water-gate in either direction, (which is concededly the same thing).



This element being common to all the claims, is not found in defendant's structure.

**"A Controller for Said Operating Means, Responsive to Changes of Speed of the Water-Wheel", Claim 3; "A Controller, Responsive to Changes of Speed of the Water-Wheel and Controlling the Reversing-Gear", Claim 4; "A Controller, Responsive to the Speed of the Water-Wheel and Controlling Said Reversing Means". Claim 8.**

These elements are pointed out in defendant's device as the line to line valve, marked "C," the only function of which is to permit the flow of fluid under pressure to one side or the other of the cylinder "B". It is a misnomer to call this valve a controller, because it is a mere passive element acted upon by the fly balls. When Mr. Cobb was asked to point out a controller in defendant's device, he very logically pointed out the fly balls. Here we have a good example of the fallacy of appellant's position.

Let us first determine, however, what the parties to this Lyndon patent contract, the government and Lyndon, meant when they used the word "controller". *The question is not what the court, the writer of this brief, or counsel for complainant might consider is properly designated by the term "controller,"* but the question is what did Lyndon and the government mean when they used the word in the patent specification and claims. It is believed that ninety-nine persons out of one hundred upon being asked to point out the "controller of the Lyndon device" if some other word were

substituted in the specification for the word “controller,” would point out the dynamo 8, because that is surely the element which is intended to control the speed. It is true, also, that the solenoid 33 might without much abuse of language be called the “controller.” *But Lyndon and the government did not designate either of these elements as the controller.*

*The context of the specification clearly shows that lever 26 is the controller.* Thus at line 25, page 2, Lyndon specification, it is said:

“The springs 27-28 enable the returning-rod 25 to exert pressure on the *controller 26* to return it to normal position, while permitting displacement of *such controller* from normal position under the action of its electromagnetic operating means.”

Lyndon has nowhere in the patent in suit referred to any other element as the “controller”; although he has referred to the solenoid 33 as a controlling solenoid; and has also referred to the lever 26 as the “circuit controller” and “controlling lever.”

Complainant has confusingly referred to the solenoid 33 as the controller, and when he points out the line to line valve marked “C” on the chart under consideration as a “controller” he means, (ignoring the plain language of the patent), that the element marked “C” is the equivalent of the solenoid 33. This confusion has resulted in *Mr. Henry’s not pointing out any equivalent of the lever 26 at all.*

Briefly, the reasons why solenoid 33 cannot be considered the controller called for by the claims of the Lyndon patent are as follows: (1), Lyndon has no-

where referred to solenoid 33 as the controller; (2), Lyndon has expressly referred to lever 26 as the controller; (3), Lyndon in some of his claims, notably claim 9, has claimed "an electromagnetic device connected to said dynamo," namely, solenoid 33, and said "controller," the lever 26 as separate elements, thereby distinguishing them and showing that there was no intention that they should be confused.

In claim 5 the controller 26 is referred to as a "circuit controller" and is claimed as a separate element from the solenoid 33 which is referred to as a "solenoid device."

The question we must discuss, therefore, is as to the equivalence of the lever 26 with the line to line valve marked "C" on said chart.

The two devices are not mechanical equivalents because their functions are entirely dissimilar. The working part of this valve "C" responds directly to the centrifugal force of the fly balls and operates merely to permit the flow of fluid under pressure to one side or the other of a hydraulic cylinder. The element, lever 26, of the Lyndon patent is merely a double lever, which, under the control of a solenoid core, makes and breaks electrical contacts. The power is generated by the dynamo 8 of Lyndon which in function and result bears an analogy to the power fluid which operates the piston of the cylinder "B" of said chart, *but in defendant's device such power fluid or the force exerted by it is not the centrifugal force of the fly balls, but comes from an entirely different source, i. e., from a tank in which it is pumped under pressure.*

If said line to line valve "C" is to be considered as the controller 26 of Lyndon, *where is the equivalent of the solenoid 33 in defendant's device?* If the line to line valve "C" is the equivalent of solenoid 33, *where is the equivalent of the controller 26?*

If the court is in doubt as to whether any analogy that might exist between the line to line valve "C" and controller 26 of the Lyndon patent is sufficient to make these elements equivalents in the technical sense, it seems that the court should be guided by the testimony of the experts *especially when those experts agree.*

Mr. Henry agrees with defendant that the line to line valve "C" is not the equivalent of lever 26 by not pointing it out *as such* equivalent, *but insisting that it is the equivalent of solenoid 33.*

**"A Returning Device for Said Controller Provided With a Clutch Connection to Said Operating-Shaft", Claim 3; "A Returning Device for Said Controller", Claim 4.**

Complainant points out a part marked "D-D" on said chart as equivalent of the above described element of Lyndon. We are met with considerable difficulty in replying to this assertion of alleged equivalency for the reason that it does not distinctly appear just what part or parts are to be included in the alleged equivalent. The line extending from the letter "D-D" appears to point out only the rack and pinion and piston of the dash pot of the construction marked "Division Creek," while in the copy furnished the writer of this brief by complainant the construction marked "Cottonwood" is



indecipherable. This difficulty not knowing exactly what complainant means is not a matter of small consequence: each and every mechanical part adjacent and connected to the rack and pinion, the dash pot and the means for regulating the flow from one side to the other, have some function in the mechanism. In order to compare functions we must know precisely what parts to compare before we can determine the question of equivalency or lack thereof. Complainant has marked the rod or part at one end of the dash pot with the letter "E" to signify that it alone or some of its connecting parts were equivalent of "means actuated by said controller, etc." (claims 3 and 4). This is a separate element in the claims, and it must be presumed that the parts intended to be marked "E" are not included in the parts marked "D-D".

We are, therefore, driven to "guess" that the rack and pinion and the dash pot, its casing, piston, and piston rod are intended by complainant to be included in his "returning device." In making this surmise, however, we are burdened with the recollection that Mr. Henry has distinctly pointed out this same piston rod and cylinder case as the equivalent of a "clutch connection". *We should not be compelled to guess because the burden is upon complainant to point out equivalents so clearly that the court can have no doubt.*

We feel that we are justified in assuming, in making this comparison, that when complainant uses the term "returning device" he means "returning device" in its broadest sense as including the alleged equivalent of the clutch. Possibly counsel would also wish to in-

clude the spring and finger connections just below the rack and pinion. In order to make some kind of an intelligible answer to the question let us so assume,—because manifestly these spring and finger parts just below the rack and pinion are very necessary to its operation. Our recollection, however, which may be verified by reference to Exhibit Z-Z is that Mr. Henry also includes “connections to the fly balls”, that is, the rod on which the pinion is mounted, as part of the returning device. Our only thorough way to answer the question is to consider all and every part of this combination of elements—considering its functions and results and means of operation. Here again we must remind the court that the fact that the broad and vague descriptive term “returning device” might describe some part or all of this combination of elements determines nothing. We must find out what Lyndon meant in his patent specification and claims when he used the term “returning device” and must compare *not a name merely, but a mechanism with its mode of operation, its precise means and finally its function and result.*

There is some confusion in the Lyndon patent as to just what part is included in the “returning device”. At line 12, page 2, appears the following:

“A returning device consisting of a rod 25, connected by a pivoted link or connecting rod 25a with the disk 22, passing through a hole in the controller lever 26, pivoted at 26a to a fixed support, \* \* \*”.

This would seem to imply that rod 25 is the returning device. This construction is also supported by the

fact that in claim 5 an element called the "returning device" is claimed as a separate element from its clutch 22 and 23. Magnet 32 cannot be included in the returning device because it is distinctly claimed as a separate element "means actuated by said controller".

It seems to say that rod 25 alone centered by springs is the returning device of the Lyndon patent, although if disks 22 and 23 are included therein, it is not seen that it will make much difference so far as comparisons are concerned. It is obvious that the returning device and its actuating means must be severed for the purpose of comparison, and also the clutch connection of or for the returning device must be pointed out or the limitations of the claims are not complied with.

This so called returning device is merely a rod centered by springs attached at one end to the disk of a clutch. It has only a short longitudinal movement, and its function is to break the circuits established by controller 26.

The language of claim 3 is "a returning device provided with a clutch connection to said operating shaft". What operating shaft? *The water-gate-operating shaft*. Now the water-gate-operating shaft has been pointed out as the rock shaft "A" of the chart under consideration in this brief, and surely neither the dash pot, the means for regulating its flow from one side of the piston to the other, the rack, nor the pinion can be described as *located anywhere near the alleged equivalent of the water-gate-operating shaft*.

The wildest kind of imagination is not sufficient to conceive any of the parts under discussion as being a clutch connection to the operating shaft.

None of the parts mentioned bear the slightest analogy to the means or mode of operation of the alleged returning device of the Lyndon patent. The dash pot with its cylinder and piston is not a clutch connection, and cannot be substituted in any mechanism to perform the function of a clutch connection. It connects no shafts. *It has absolutely nothing to do with either the alleged equivalent of the driving shaft or the water-gate-operating shaft, or any other shaft.*

The function of the said dash pot of defendant's device is to allow the end of the rack furthest from the dash pot and the end of the piston rod furthest from the dash pot to alter their points of separation. In operation it is very closely analogous to a block of rubber placed between the ends of two shafts which by compression will shorten the total length of the construction and which by its elasticity will allow the two shafts to be further separated. The dash pot has no other function.

That all this mechanism, or parts of this mechanism, was intended for a purpose very analogous to that of Lyndon's rod 25 is beside the point. The two devices are as different from each other as might be possible.

The parts indicated by the letter "E" as "means connected by the controller to engage said clutch with said shaft" surely reached the limit for absurd comparisons. What clutch and what shaft? "Engage" is a word of very definite meaning, and how can it properly



be applied to a relation with the shaft marked "A" and indicated as an alleged equivalent of the water-gate-operating shaft?

**"Means, Actuated by Said Controller on Movement Thereof From Normal Position to Engage Such Clutch With Said Shaft", Claim 3; "Actuating Means Controlled by Said Controlling Means", Claim 4.**

This language refers clearly mainly to magnet 32 as well, perhaps, as some of the means by which its energization is effected. When energized this magnet 32 performs the simple function of, by attracting its armature, throwing lever which operates a clutch connection.

The parts evidently intended by the letter "F" on the chart under consideration, *merely operate to vary the flow of oil from one side of a dash pot to the other*. How that can properly be called "actuating means" is surely beyond comprehension. There are two "actuating means" in the governor mechanism of defendant: (1), the fly balls; (2), the power fluid under pressure. The means which cause movement of the dash pot is the piston rod of the cylinder "B" and the parts pointed out by "E" clearly only govern the quality and variability of movement of the rack and pinion.

The writer sees no way of further answering the question except to reiterate that the means for varying the flow of oil from one side of a dash pot to another *which do not initiate any movement* surely cannot properly be called "actuating means" in any sense and surely not in the sense of the Lyndon patent.

### “Driving Shaft.”

It is rather amazing to have counsel point out the shaft marked “F” on the chart in question as the driving shaft. If there is any evidence in the record of any witness who pointed out this shaft as a driving shaft, we earnestly suggest that the court request counsel to state where. *Mr. Henry distinctly and positively pointed out the shaft which operates the fly balls as the equivalent of the driving shaft of the Lyndon patent.* [See complainant’s Exhibit Z-Z, where Mr. Henry’s marking plainly appears.]

It is believed that this contradiction by counsel of complainant’s testimony as an expert should be construed strongly against him. This is the first notice that defendant has had that complainant wishes to shift his position with regard to the driving shaft.

The long rod that connects the double lever which is connected directly to the shaft “A” and the link connected to the shaft “F” might with as much reason be termed a driving shaft.

Defendant’s witnesses refer to the main shaft of the water-wheel of defendant’s device as a driving shaft. Many other straight members might possibly be called driving shafts.

The element of the Lyndon patent referred to as driving shaft is clearly the shaft 6. This is admitted by Mr. Henry, [Record, Vol. 1, page 321, Q. 214]. It is also obvious from a study of the context of the patent, as some of the claims call for both a water-gate-operating shaft and a driving shaft connected by a clutch gear in reverse driving relations, or words to

that effect. We have seen that the context of the patent is such as to compel the conclusion that shaft 12 in most of the claims, at least, is the water-gate-operating shaft. These two shafts are connected by the reversing clutch gear, an element which we have seen is not found in defendant's device.

Complainant attempts to read the cylinder "B" as the reversing clutch gear. This cylinder "B" does not connect shafts "F" and "A" in reverse driving relations. Both of these shafts are merely rock shafts,—that do not revolve like the Lyndon shafts. When they move through their very limited arc of movement *they move in the same direction.*

*The driving shaft of Lyndon performs two functions:—(1), it forms one of the shafts through which the dynamo is energized; (2), it forms one of the means through which the water-gate and by-pass valve are moved.*

The new alleged equivalent of this driving shaft, namely, "F" of said chart, *has no connection whatever with the alleged equivalent of the dynamo, namely, the fly balls.* This shaft "F", therefore, clearly does not perform the function of the shaft 6 of the Lyndon patent, and is therefore not its mechanical equivalent.

**“A Valve Controlling Said By-Pass” of Claim 6;  
“A Valve for Said By-Pass”, Claim 7; “A Valve  
for Such By-Pass Normally Held in Partly-  
Open Position”, Claim 8.**

Lyndon shows a butterfly valve, and the part “G” is a needle nozzle. Defendant’s needle nozzle should not be considered the equivalent of Lyndon’s butterfly valve, because of the difference in mode of operation and result. Defendant’s nozzle is normally closed, thereby economizing water; Lyndon’s valve is normally half open. Defendant’s nozzle is a safety device intended to protect the pipe line from excessive pressures; Lyndon’s valve was intended to maintain the velocity of the water projected against the wheel uniform, for governing purposes only. Defendant’s main needle moves many times to govern the water-wheel without a corresponding inverse movement of the auxiliary nozzle. This is because the auxiliary nozzle is designed only to operate upon extreme fluctuations of load resulting in dangerous pressures. Lyndon was struggling with a different problem.

Defendant can safely disregard the inertia effects which interfere with proper governing because of the peculiar conditions of the pipe line,—a steep pipe line, which permits water to accelerate quickly and thus makes any lag of the water when the main gate is opened negligible. Mr. Lyndon was evidently considering only pipe lines which were not so steep—in which the velocity of the water was not so great. He was not trying to solve the problem defendant’s device provides for. It is thus a different principle of operation



and the distinction that defendant's auxiliary nozzle is normally closed becomes of great importance, for it indicates a different principle of operation.

Even the letter of claims 6 and 7, therefore, does not read on defendant's construction for the movements of the main and auxiliary nozzles cannot be inverse in both directions at all times, as plainly contemplated by Lyndon. The butterfly valve is a very old form of valve. It is supplanted in defendant's device with this needle nozzle. It does not operate in the same manner.

**“Means Connected to the Water-Gate-Operating Means and Operating the By-Pass Valve Inversely to the Operation of the Water-Gate”, Claim 6; “Means Connected to the Water-Gate-Operating Means and Adapted to Operate the By-Pass Valve From Normal Position in Either Direction, So as to Control Such Valve Inversely to the Control of the Water-Gate, During the Governing Action of the Water-Gate”, Claim 7.**

Complainant has also marked with the letter H on said chart the element of claim 8 described as “means operated by said controller to bring the aforesaid clutch” (clutch 57 and 58) “into operation and to release said clutch when the governing action is effected.”

The inclusion of this last described element under the designation “H” is another glaring example of the confusion, accidental or otherwise, which complainant is constantly injecting into this case. The “means” last referred to of claim 8 clearly indicate *compen-*

*sating magnet 64.* It is obvious that the part marked “H” on the chart under consideration bears no analogy whatever to the magnet 64. Its further consideration would be foolish.

Referring to the language of claims 6 and 7 above quoted, and leaving out of consideration the last named element of claim 8, we find that the language of the claims clearly refers to the sheave 54 with its associated mechanism, including the ropes to the stem of the by-pass valve 48 of Lyndon, but does not include the weights 70, because they are claimed as a separate element, i. e., “means for returning the by-pass valve to normal position.”

The difference as a “means” of the part marked “H” on the chart under consideration and the parts referred to in the Lyndon patent is very glaring. The manner in which the sheave wheel and ropes open and close the by-pass valve, and in which it is prevented from further operation by breaking of a contact shows not only different means for effecting an analogous result, but a totally different method of operation.

We have shown that the part marked “A” is not the equivalent of the water-gate-operating shaft of the Lyndon patent; it follows that this double lever marked “H” is not connected to any water-gate-operating means within the meaning of the Lyndon patent.

Moreover, this part “H” does not operate any by-pass valve inversely to the operation of the water-gate *at all times* in the sense of the Lyndon patent, because *owing to the intervention of the dash pot marked “I” on said chart (which is shown on argument to be de-*

*signed to permit movement of the main needle without a corresponding movement of the auxiliary needle) the main needle may always move in an opening direction without any movement of the auxiliary needle because such needle is normally closed, and upon a slight movement of the main needle in either direction there is no inverse effect communicated to the auxiliary needle. This is because of the intervention of this dash pot, which is especially designated to secure this effect, and the fact that this effect was found desirable and was provided for conclusively shows a different principle of operation from the Lyndon device.*

The language of this claim must of course be read in the light of the specification, and its spirit must be considered as well as its letter. Merely because the auxiliary needle may, while off its seat, happen during a quick series of governing movements to be operated momentarily inversely to the auxiliary needle, does not mean that the two devices are similar in principle or in effect.

Counsel's insistence upon some of the testimony to the effect that when a series of extreme fluctuations of load occur upon the use of a dredge, or for other reasons, that the auxiliary nozzle would leave its seat, and while the auxiliary needle was slowly returning to normal position, there might be a further opening movement of the main needle, is merely a laborious effort to turn a mere superficial and incidental resemblance at certain periods only, and which is not an operation in accordance with Lyndon's theory, into a similarity in principle.

It is also obvious that the change in form from the butterfly valve of Lyndon to the needle nozzle of defendant involves the use of widely different means.

There has been a strenuous attempt on the part of complainant to reinvent the Lyndon device *so that its by-pass valve could be normally closed*. This cannot be done without departing from the principle of the Lyndon invention, because when we close Lyndon's by-pass we must readjust our circuits, thus rendering much of the mechanism of the Lyndon device useless, and abandoning Lyndon's *express intention of overcoming inertia effects in both opening and closing directions*.

**"A Clutch, Adapted to Connect Said Operating Device for the By-Pass Valve With the Water-Gate-Operating Shaft to Control the By-Pass Valve Inversely to the Water-Gate", Claim 8.**

Our argument with respect to the dash pot marked "D" on the chart under consideration, that a dash pot is not a clutch, may be here repeated. This dash pot "I" operates exactly like that at "D" in allowing the ends of the shaft protruding from it to become nearer or further apart, that is to say, if we took out this dash pot and put in a block of soft rubber we would have a very close analogy because the rubber might compress or stretch, thus enabling the needle and the furthest end of the shaft marked "J" to be moved further apart or nearer together. How such dash pot can be likened to a "clutch" is difficult to understand. It is clearly not a clutch; it does not perform



any of the functions of the clutch. There are no two simple devices which are more dissimilar in their purposes and mode of operation. Moreover, the precise language of the claim calls for a "clutch adapted to connect said operating device for the by-pass valve" (sheave 54, etc.) with the water-gate-operating shaft. This language clearly referring to the clutch shows that a positive connection of the clutch to the shaft is contemplated. Assuming for the sake of argument that "A" of the chart under discussion is the water-gate-operating shaft as pointed out by complainant, (though we have shown clearly that it cannot be so maintained), *this dash pot does not connect any operating device (which operating device is pointed out as the short shaft "J") with the water-gate-operating shaft.*

**"An Operating Device for Said Valve", (By-Pass Valve), Claim 8.**

This language of claim 8 refers clearly to the sheave 54 and ropes of the by-pass valve. If complainant had been consistent, and regarded the plain meaning of the claim he would have marked this element H instead of J. All we can say is that this little piece of shaft J bears no analogy to the sheave 54 and ropes. *This is a good illustration, however, of the ease with which the descriptive terms of the claims can be applied to most any kind of a mechanism.*

Counsel points out the double lever marked H as the equivalent of this operating device as to some of the claims, but shifts to this little piece of shaft as to claim 8 without any regard for consistency. In doing this,

however, he overlooks entirely the part of the claim reading “a clutch adapted to connect *said operating device for the by-pass valve with the water-gate-operating shaft*”.

If A is the water-gate-operating shaft as contended for by complainant, I the clutch and J the operating device, it is clear that the so called equivalent of the clutch does not connect the so called equivalent of the operating device with the water-gate-operating shaft.

**“Means for Returning the Valve to Normal Position”, Claim 8.**

In the Lyndon patent in suit, this language refers obviously to the weights 70 which tend always to bring the Lyndon by-pass valve back to its normal half open position. If in the process of governing the Lyndon by-pass valve closes, these weights 70 are designed and their relation with the other parts of the mechanism is such as to cause the Lyndon by-pass valve to move to its half open position. The tendency of the springs indicated by the letter K of complainant's chart is to always close the auxiliary needle, and there is nothing to prevent it from doing this. This auxiliary needle will always close, after governing movement, thus economizing water, while Lyndon's by-pass operating on a different principle, will always return to half open position. This distinction is fundamental. Lyndon's alleged invention related to a device which accomplished governing regardless of water economy, and with a constant waste of water. It was necessary to

allow this waste in order to overcome the inertia effects *detrimental to governing in both directions*.

Lyndon's problem related to water flowing through a pipe line at a low velocity. He did not attack the problem nor see the importance of the problem, of economizing so as to conserve water. The pipe lines that Lyndon had in contemplation were not steep, and water did not flow with sufficient velocity to make it unnecessary to regard the inertia effects upon moving of the water-gate in an opening direction. In the conditions controlling the device used by the defendant the great problem was to overcome only dangerous inertia effects, dangerous to the safety of the pipe line, caused by a too rapid closure of the main needle. Lyndon never thought of inertia effects dangerous to the pipe line. This difference in normal position of Lyndon's by-pass and the auxiliary relief nozzle needle of defendant shows a new principle, a new law of operation, and is therefore a vital difference. and if there were no other difference in the whole case—if the mechanism were very closely analogous, if defendant used the same electromechanical devices, *this difference in principle would avoid the charge of infringement*.

Defendant's springs do not, therefore, perform the same function as Lyndon's weights.

**“A By-Pass Valve for the Water-Wheel”, Claims 6, 7 and 8.**

We have constantly reiterated a warning against the danger of falling into the fallacy of supposing that

things to which the same descriptive language might apply were the same. It must be borne in mind that the by-pass of the Lyndon claims is the by-pass of his description and drawings, namely: *a by-pass in a normally half open position*, allowing a constant waste of water for the purpose of overcoming inertia effects *detrimental to governing in both directions*. Defendant does not use such a by-pass and does not regard the natural law forming the basis of Lyndon's alleged invention, for the reason that another natural law has neutralized the effect of the first, namely: the law of gravitation operating through a steep pipe line increasing the velocity of the water has made it possible for defendant to disregard Lyndon's theory. The court should not, therefore, permit the function of the opening of this safety nozzle to protect the pipe line against excessive pressures to be mistaken for the functions of Lyndon's by-pass.

We have constantly emphasized the law that the omission of but one element of a combination claim by a defendant, will defeat a charge of infringement. We have clearly established that not only one but many elements have been omitted from defendant's device; that the principle of the device of defendant's device is different from complainant's, and that the entire assembly, kind and arrangement of means for effecting the result is different. This required a finding of non-infringement.

In considering the indefinite language of claims 6 and 7 "*means for operating the water-gate in either*



direction"; (clutch gear 9, 10, 13); "*means* for operating the by-pass valve inversely to the operation of the water gate" (sheave 54 and connections); "*means* for returning the by-pass valve to normal position" (weights 70) it is very important for the court to remember that this apparent looseness of language does not warrant its being construed to cover every *means*, but only those shown in the patent or their mechanical equivalents.

In determining whether the defendant's device infringes the Lyndon by utilizing the Lyndon combination as expressed in any one or all of the claims, the court must look at the element going to make up defendant's device, and how they co-operate to perform their respective functions. We are considering things, not mere words. This shows the glaring error of appellant's position, which position is clearly stated on page 15 of appellant's brief, in italics:

"The defendant's structures fall within the clear language of the broad claims of the patent in suit, and even the terminology of the narrower claims finds its equivalent expression in defendant's structures."

"Language", "terminology", words, not things, are what appellant is harping upon,—what he compares. But as said by Circuit Judge Hough, in *Linde Air Products Co. v. Morse Dry Dock & Repair Co.*, (246 Fed. 834, C. C. A. 2nd Cir.):

"There is no magic in a name, nor in a claim; that the words preferred by a patentee to define

his invention apply literally to another's device suggests, but does not prove, infringement; there must be substantial identity, to justify that conclusion of law. *Edison v. American Co.*, 151 Fed. 787, 81 C. C. A. 391."

Justice Clifford, in *Bates v. Coe*, 98 U. S. 68, says:

"Devices in one machine may be called by the same name as those contained in another, and yet they may be quite unlike, in the sense of the patent law, in a case where those in one of the machines perform different functions from those in the other. In determining about similarities and differences, courts of justice are not governed merely by the names of things; but look at the machines and their devices in the light of what they do or what office or function they perform, and how they perform it, and find that a thing is substantially the same as another, if it performs substantially the same function or office in substantially the same way to obtain substantially the same result; *and that devices are substantially different when they perform different duties in a substantially different way, or produce substantially a different result.* *Cahoon v. Ring*, 1 Cliff. 620." (Italics ours.)

The decree of the District Court was right and should be affirmed. The facts of the case fully support the conclusion of the District Court:

"If the defendant's device was manifestly a copy of the complainant's machine with the exception that the defendant had substituted a dashpot for a solenoid, or a dashpot for a reversible clutch gear, or a needle valve in the by-pass for a butterfly valve, in order to avoid infringement, the court might well look with more

favor on the claim that such elements should be regarded as equivalents. But where it is manifest that the whole conception of the alleged infringing device, and all its elements, are different, and where the machines are intended to operate on a different principle, the court could not decide such things to be equivalents without doing violence to the rule of law on the subject.

The complainant has not sustained the claim of infringement." [Record, Vol. I, page 72.]

Respectfully submitted,

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No. 3108.

IN THE

# UNITED STATES CIRCUIT COURT OF APPEALS

FOR THE NINTH CIRCUIT

GEORGE J. HENRY, JR.,  
*Appellant,*

VS.

CITY OF LOS ANGELES,  
*Appellee.*

## APPELLANT'S REPLY BRIEF

RAYMOND IVES BLAKESLEE,  
Solicitor and Counsel for Appellant.

Filed this.....day of July, 1918

FRANK D. MONCKTON, Clerk

By.....Deputy Clerk.



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**APPELLANT'S REPLY BRIEF**

We find we have so thoroughly, in our opening brief, anticipated the discussion of the points indulged in by Appellee, that, to avoid repetition, there remains little to be done other than to recall to Your Honors' attention certain pertinent portions of our opening brief, together with short further references to the record and the law. However, lest the court be deceived and led astray, we feel it our duty to further direct attention, perhaps at some length, to certain specific instances in which counsel for Appellee has clearly and flagrantly departed from the law and the facts. Throughout Appellee's entire brief there is the clear intention to cloud the big, broad issues of

this case by distorting and magnifying the unessential and immaterial details, all of which can in no way affect a proper determination of this appeal.

### LYNDON'S CONTRIBUTION TO THE ART.

Prior to the advent of the Lyndon invention, the record shows that there was a diligent search being made for the device which Lyndon invented. Defendant's expert Cobb was diligently searching and his clients needed such a governor. (R. 674, Q. 126, 600; Q. 14; also pages 600-731-674-675. See also Scattergood, page 534.) See also in this connection the testimony of Prof. Cory of the University of California, R. 250 to 260; also 264-265-266. See especially R. 468. He testified that the Lyndon invention was used by the Doble Water Wheel Company and by the Pelton Water Wheel Company and others. R. 262. The Lyndon invention is adaptable to the varying requirements of the different water wheel plants with which it may be employed. R. 522, 523, 466, 285, 276. See also the testimony of Lyndon, the inventor, R. 1948 to 1954. This shows the practical adaption and operation of the invention by the inventor.

The matter of Lyndon's contribution to the art is also covered in our opening brief, pages 1 to 8 inclusive, and also page 31.

### VALIDITY AND SCOPE.

This is covered in our opening brief, pages 47 to 51, and on pages 9 to 19. Particular attention is di-



rected to the table facing page 48. We contend that Lyndon was the inventor of the new and useful combinations of parts which separately may have been old in the art, including connective means for certain of the main elements. We contend that even if the French and Swiss patents were properly proven in the case, they cannot avail defendant as anticipation, because plaintiff has thoroughly established and proven the incipency of the Lyndon invention, carrying the date of that invention back to a time prior to the alleged publications of these patents. (See opening brief pages 49 to 50.) This is done by proofs of the strongest character and beyond a reasonable doubt, and follows the established rule that *while an anticipation must be a completed thing, publicly known and publicly used, the incipency of an invention may be proven by matters less than public action or public use, such as, for example, an oral or written description or sketch.*

The rule asserted by Appellee as laid in *Automatic v. Pneumatic*, 166 Fed. 288, is not the rule that applies in proving incipency. The distinction clearly appears in Walker, Section 70, quoted below. It is rather the rule that applies to competing inventors, each of whom is seeking a patent for, or asserting the right to, the same invention. Under such circumstances, the diligent party who first reduced to practice will prevail.

Under all the authorities, and within every conceivable requirement of the law, appellant has carried back the date of the invention of Lyndon by oral description and disclosure to others, by sketch dis-

closed to others, by written description disclosed to others, and by caveat consisting of written description and drawings, filed in the United States Patent Office, all prior to the date of publication of the French and Swiss patents. Walker on patents, 5th edition, Sec. 70, page 86, states this law as follows:

“In order to apply the rule of the last section, it is necessary to fix the date of the invention covered by the patent sought to be anticipated. In cases where the invention may be exhibited in a drawing or in a model, it will date from the completion of such a model or such a drawing as is sufficiently plain to enable those skilled in the art to understand the invention;

Loom Co. v. Higgins, 105 U. S. 594, 1881;

Deering v. Harvester Works, 155 U. S. 298, 1894;

Heath v. Hildreth, 1 McArthur's Patent Cases, 24, 1841;

Perry v. Cornell, 1 McArthur's Patent Cases, 78, 1847;

Farley v. Steam Gauge Co., 1 McArthur's Patent Cases, 621, 1859;

Hubel v. Dick, 28 F. R. 139, 1886;

Von Schmidt v. Bowers, 80 F. R. 140, 1897;

Moline Plow Co. v. Rock Island Plow Co., 212 F. R. 727, 1914.

and patented inventions always date at least as early as the dates of the execution of the original appli-

cations therefor, provided the original applications exhibit the inventions with the above-mentioned extent of sufficiency.

Kearney v. Railroad Co., 32 F. R. 322, 1887;

National Machine Co. v. Brown, 36 F. R. 321, 1888.

In cases where a patented invention was explained in words, without the aid of any model or any drawing, it will date from the completion of such a written description as would teach others how to make and use the invention described. In cases where the inventor makes a specimen of the thing invented, before he makes any model, or drawing, or written description to represent that thing, the invention will date from the completion of that specimen. Perfection is not necessary to such a specimen in order to entitle it to such an effect. Substantial completeness is enough.

National Cash Register Co. v. Store Service Co., 60 F. R. 603, 1894;

Coffee v. Guerrant, 68 O. G. 279, 1894.

And where the distinguishing characteristic of an invention, consists of a composition of matter capable of considerable variations in its ingredient, the invention will date from the time when the first of those variations was reduced to successful practice.

American Sulphite Pulp Co. v. Howland Falls Pulp Co., 80 F. R. 401, 1897.

No invention ought to date from any day wherein it had no existence or representation outside of the mind of the inventor, no matter how clear or how complete his mental conception of its character and mode of operation may have been. Mental conceptions are not useful inventions until they are so embodied that the world could use them after the deaths of the persons who conceived them.

Clark Thread Co. v. Willimantic Linen Co.,  
140 U. S. 489, 1891;

Voightman v. Perkinson, 138 F. R. 56, 1905;  
Killeen v. Buffalo Furnace Co., 140 F. R. 33,  
1905;

Corrington v. Westinghouse Air Brake Co.,  
178 F. R. 711, 1910.

To allow inventions to take date from mental conceptions, would strongly tempt inventors to commit perjury in order to appear to anticipate real anticipations of their patents.

Whether an oral description given by the inventor to another, of a subsequently patented invention, can give that invention a date earlier than that to which it would otherwise be entitled, depends upon the nature of the invention and the capacity of the hearer to understand it and remember it. Where an invention is abstruse or is complicated, and where it is not certain that the hearer understood it and has remembered it well enough to communicate it to the world in case of the inventor's death, the invention ought not to date from such a description.



Stephens v. Salisbury, 1 McArthur's Patent Cases, 385, 1855;

But where it is shown that the person to whom such an oral description was given understood it completely, and has remembered it accurately, a patented invention may date back to that oral description.

Philadelphia & Trenton R. R. v. Stimpson, 14 Peters, 448, 1840;

Stephens v. Salisbury, 1 McArthur's Patent Cases, 385, 1855;

Hill v. Dunklee, 1 McArthur's Patent Cases, 483, 1857;

Davidson v. Lewis, 1 McArthur's Patent Cases, 599, 1858;

McCormack Machine Co. v. Harvester Works, 42 F. R. 153, 1890;

Merrow v. Shoemaker, 59 F. R. 122, 1893;

Westinghouse Electric & Mfg. Co. v. Roberts, 125 F. R. 6, 1903.

In such cases it is not necessary that all the mechanical details shall be expressed in the disclosure or even have been thought out.

Westinghouse Electric & Mfg. Co. v. Stanley Inst. Co., 133 F. R. 167, 1904.

The reason for allowing a patented invention to date back to an oral or a written description, or to a drawing or a model, as the case may be, while an unpat-

ented invention, which is set up to negative the novelty of a patented invention, is not allowed to date back to either of those things, resides in the fact that those things are incipient in their nature, and in the principle that an invention which is ultimately developed and given to the world in a patent, ought equitably to date from such an incipency, while the rights of a patentee ought not to be impaired by a similar incipency which was never developed into a patent.

*Bowers v. Von Schmidt*, 63 F. R. 577, 1894.

When a patent is questioned in point of novelty, and when that question depends upon the date of the invention claimed in that patent, it is not material whether the event, which constituted that invention, occurred in the United States or in some other country.

*Hanifen v. E. H. Godshalk Co.*, 78 F. R. 811, 1896;

*Hanifen v. Price*, 96 F. R. 441, 1899;

*Welsbach Light Co. v. American Incandescent Lamp Co.*, 98 F. R. 616, 1899;

*Badische Anilin & Soda Fabrik v. Klipstein & Co.*, 125 F. R. 543, 1903.

For a very complete discussion of the whole subject of priority of date of invention as between two inventors, see the opinion of Judge Colt in *Automatic Weighing Machine Co. v. Pneumatic Scale Corporation*.

Automatic Weighing Machine Co. v. Pneumatic Scale Corporation, 166 F. R. 1909;

McCreery Engineering Co. v. Mass. Fan Co., 195 F. R. 498, 1912.

Attention is called to the fact that the law, as above stated, applies particularly to the proofs in this case, in that the witnesses Meyer, Reid, the younger Lyndon and others, were skilled and technical men thoroughly capable of understanding the disclosures made to them verbally and with sketches by the inventor, Lyndon, and it is plain from their testimony that they fully understood such disclosures. The invention was not, to them, abstruse or complicated. It is only the specific details of the mechanism which at all run into complication, and as to these the law, we see, makes it clear that it is not necessary for the same to be expressed in the disclosure or even to have been thought out.

The inventive thought and conception, and in fact every stage of the inventive act, except actual use or application for patent, had been completed by Lyndon, as the record fully demonstrates, long prior to the alleged publications of the Swiss and French patents.

Appellee contends that if narrowly construed to avoid the French and Swiss patents, Lyndon will be anticipated as to claims 6 and 7 by the Bakersfield device. This is a direct misstatement of facts. There is no testimony to indicate that there was any return of the so-called bypass valve at Bakers-

field, at any time after governor action and the testimony is very strong to the contrary. Lyndon's claim 7 is drawn specifically to an independent movement of the bypass valve *after* governing action. Counsel gives the direct lie to his own statement, that claim 7 is anticipated by Bakersfield, when he says on page 112 of his brief, commencing line 9 from the bottom: "The bypass valve and the main gates of this Bakersfield device were connected *solidly together* so as to work synchronously, the operation closely resembling that of the defendant."

(Throughout this brief, the italics used are generally ours.)

Defendant's witness Berry admits (R. 1307 to 1309, QQ. 854 to 863) that defendant's exhibits XX and Journal of Electricity, Vol. 6, disclose inoperativeness of the Bakersfield installation, as therein shown. Berry was admittedly an incompetent witness to testify in any respect as to any attempted operation of the Bakersfield experiment. He admits he had no knowledge of it personally, that is, of anything that occurred at that plant, after the tests of the Girard water wheels, which were the first wheels installed at that plant. (R. 1190.) Defendant's witness Cobb rendered his report on these tests under date of August 24, 1897. This report admits the failure of the alleged bypass and its associated parts. (R. 751 to 756.) Cobb likewise admits that he was not present at the installations or tests of any water wheels at this plant



after the date of his August, 1897, report. (R. 602.) The part of this report, containing the matter admitting the insufficiency and failure of the alleged bypass device at that plant, was sealed up when defendant offered such report in evidence, and was only opened to inspection after complainant had so demanded. This part of the report, which defendant or Cobb tried to suppress and conceal, absolutely refutes the testimony given by Cobb that the bypass device was useful. (R. 603 to 606.)

All of counsel's contentions are specifically met in our opening brief, pages 29 to 32 inclusive, as regards this Bakersfield device; and the type of valve which was put in at Bakersfield as a bypass attempt was an entirely different type of valve from that employed by Lyndon and intended to operate upon a different principle. It is known as the *Friction* type of valve, whereas the Lyndon valve was a *Frictionless* valve; and it is a vital element which precluded successful operation on the part of the Bakersfield installation. No governor could sensitively operate, as is necessary in electro-mechanical practice, with such a type of valve as used in the Bakersfield installation. The friction would absolutely annihilate any sensitiveness, acting as a brake and preventing the operation of the governor. The effort to use the friction type of valve at Bakersfield by Cobb, Van Emon and Berry, whether they are individually or collectively responsible, is clear evidence that they missed the fundamental requirements of successful governing.

and the evidence is replete that the Bakersfield device was scrapped and sold for junk because it was unsuccessful—it would not govern. Cobb subsequently installed water wheel plants; Berry subsequently installed water wheel plants. Neither one ever built another governor like that which they attempted to put on at the Bakersfield plant, nor such a bypass valve. Cobb used his patent pressure regulator and Berry used other forms of governing in all of their subsequent installations. The entire system of governing was changed at the Bakersfield plant. See the testimony of Prof. Cory, R. 2300 to 2303, that the Lyndon Butterfly valve was different and worked and did accomplish what Lyndon claimed for it, as distinguished from the Bakersfield type of valve. The plug cock type of valve adopted at Bakersfield would act as a brake not only to interfere with, but to prevent, successful operation (see pages 2304 to 2308).

After Lyndon taught the use of the frictionless type of valve to secure proper governing relations, Cobb very clearly distinguishes between the Bakersfield friction type and the non-friction type of the Lyndon combination. (R. 789-790.) As we have seen in our opening brief, pages 34 and 35, this frictionless type of valve may properly be read into claims 6, 7 and 8. While there is no evidence that the exact specific thing of the Lyndon patent drawings has ever been put into actual use, it is to be remembered that claims 3, 4, 6, 7 and 8 are not limited to any such exact thing at all, and, therefore, it is not fair to say that the invention has not

been put into use. The broad invention, the record shows, has been extensively used and it does not lie in the mouth of this defendant, one such user, to urge a narrow interpretation of claims which it has pirated for any such reason. In equity and patent law its very practice of such broad invention estops it from any such technical defense. We know of no authority supporting defendant in such a defense under the circumstances recited. It might have attempted to use the Bakersfield failure, the Grass Valley experiment, the French and Swiss attempts and the English and Wetmore and Lamb dead issues. But, like most accused infringers, while praising the prior art, defendant uses plaintiff's invention.

The cases in which narrow patents were not permitted to dominate the art concerned because their specifically claimed inventions had not been used, do not stand in point with the present situation which involves a foundation or pioneer patent. We have the authority of the Supreme Court in the Paper Bag case (210 U. S. 405) for our contention that a patent and its invention may be long pigeon-holed before suit under such patent, and yet the patent may be broadly interpreted and found infringed, as occurred in that case.

Again, a great deal is said by appellee to the effect that the patent in suit should be narrowly interpreted because the device of the drawings is not a fully perfected and entirely commercially refined apparatus. It suffices to briefly remind ourselves that the specific device of the Bell Telephone pat-

ent, the specific devices of the Edison Phonograph patent, the specific device of the Wright Brothers Flying Machine patent, and so on throughout the brilliant list of patents for big underlying inventions, were all crudities which would not be used by anyone today; and which but feebly, and in a bungling way, and with many defects, served as crude embodiments of the broad inventions concerned. In the Wright Flying Machine patent some of the broadest claims were limited to a flat plane which represented absolutely imperfect practice, and which nobody has used since the early days of the experimental flights. Counsel for appellant happened to be of counsel for defendants in the first suit under the Wright patent, and is fully conversant with the facts and circumstances involving both plaintiff's and defendants' structures. (See *The Wright Company v. Herring-Curtiss Company, et al.*, below.) And while we have that decision before us, we wish to point out another grievous error into which appellee's counsel has fallen in this case, namely, his argument to this Court, that because appellee has perhaps not fully utilized each and every attribute and quality and function of the Lyndon invention, the question of infringement is in doubt. On one side of this question, namely, the use or non use of every advantage of the invention, our opening brief contains conclusive authority, pages 58 and 59. On the other side of the question, namely, that which concerns the performance by the defendant's machine of *all* the



functions of the invention of Lyndon *at all times*, we wish to call to Your Honor's attention the well-established doctrine of potential infringement, that is, infringement in and by the construction of defendant being adapted to infringe or so organized as to be capable of infringement, by adjustment, or actually to infringe under certain conditions and at certain times. A leading case on this doctrine is that of *King Ax Co. v. Hubbard*, below, together with the above cited case of *The Wright Company v. Herring-Curtiss Company, et al.* In the latter case the Court held that although defendants' rudder was not at all times used when balancing of the machine transversely took place, this combination of rudder and balancing means claimed by plaintiffs was nevertheless present in defendants' machines and was in fact at times used, although there was no physical connection in an operative sense between the rudder and the balancing devices. In fact, only by human intervention was the combination completed and its function performed. In the *Weed Chain Tire Grip* cases, below, this same question of a function suppressed, disguised or dormant at times was squarely raised on the issue of infringement and infringement was found in view of the potentialities present. Your Honors have passed upon this same question recently as to the structural camouflage introduced by dependant, in *Union Tool Company v. Wilson*, 249 Fed. 736, *Advance Sheets Federal Reporter* of July 18, 1918.

The same counsel represented the defendant in

said case and made the same unsound argument on this question of law as he makes here.

Walker on Patents, Fifth Edition, Section 368a, page 456, has the following on this question of potential infringement, suppressed function, or the non-use of invention at most times, although adaptation for such use, and such occasional use, be present:

“Structures which are designed merely for the purpose of evading the spirit of the invention but which contain all the elements of the claims, are infringements of the patent. For example, infringement may not be evaded by adding to the structure of the patent an easily discarded part which may or may not be used by the purchaser, although if used the structure would not be within the scope of the patent.

Weed Chain Tire Grip Co. v. Cleveland Chain & Mfg. Co., 196 F. R. 213, 1910;

Parsons Non-Skid Co. v. Atlas Chain Co., 198 F. R. 399, 1912;

Parsons Non-Skid Co. v. Asch, 196 F. R. 215, 1912.

Likewise the charge of infringement is not averted by a showing that the structure may be and occasionally is used in good faith in a manner that will not infringe if it would infringe when used in the normal, easiest and most effective way.

Marconi Wireless Telegraph Co. v. DeForest Telephone and Telegraph Co., 225 Fed. R. 65, 1914;

Parsons Non-Skid Co. v. Atlas Chain Co., 198 F. R. 399, 1912.”

On this same question of suppressed function, ex-President Taft, then Circuit Judge, has the following to say, in *King Ax Co. et al. v. Hubbard* 97 Fed. R. 795, a decision of the Circuit Court of Appeals for the Sixth Circuit, reading from page 803:

“This is an instance, not infrequent in patent litigation, where the infringer has sought to evade the claims of a patent, the substance of which he is appropriating, by deliberately impairing the function of one element, without destroying the substantial identity of structure, operation and result. *Sewall v. Jones*, 91 U. S. 171; *Coupe v. Weatherhead*, 16 Fed. 673; *Machine Co. v. Binney*, 24 Fed. Cas. 653. This court, following the Supreme Court, has pointed out in a number of cases that the more meritorious the patent, the more liberal will the court be in applying the doctrine of equivalents to cover devices adopted for the purpose of appropriating all that is good in a patent without rendering the tribute which the patent law was intended to secure, for a temporary period, to those who by their ingenuity have made possible real progress in the industrial arts. *Bundy Mfg. Co. v. Detroit Time Register Co.*, 94 Fed. 524; *McCormick Harvesting Machine Co. v. Aultman, Miller & Co.*, 37 U. S. App. 299, 16 C. C. A. 259, and 69 Fed. 371; *Wells v. Curtis*, 31 U. S. App. 123, 13 C. C. A. 494, and 66 Fed. 318; *Miller v. Manufacturing Co.*, 151 U. S. 186, 207, 14 Sup. Ct. 310.”

Equally unsound is counsel's argument that the Lyndon invention has as its life-giving principle or identifying characteristic the normal positioning or the usual positioning of the bypass valve in a half-

open position. The same counsel made the same sort of restrictive and limiting argument for defendant in *Parker v. Automatic Machine Company*, 227 Fed. R. 449 and His Honor, Judge Van Fleet, in his opinion (page 452) went to considerable length to show the folly of such abortive, revolutionary and unsound reasoning, which would single out some specific item of the description and drawing of the patent and have it that the combination as an entirety, in all its breadth and importance, be tied down, hampered, restricted and emasculated by any such mere detail concerning the one particular form shown.

Quoting from Judge Van Fleet's said decision:

“Defendant's contention is, in fact, that the so-called ‘elevator’ feature of plaintiff's device is its ‘life-giving principle,’ and it is so essential to the successful operation of the entire combination of correlated parts that without it the machine is not workable, and that consequently ‘there can be no infringement of the Parker patent by any machine which does not employ the same principle of action, to wit, the elevator principle.’ In this I am unable to accept defendant's view, but am satisfied that he greatly magnifies the functional value of that element in its relation to the other features of the combination. As I regard it, this feature of the feed mechanism of plaintiff's device is in no wise essential to its life; nor do the terms of the patent make it so. Any other means of an equivalent nature may be substituted for it and still be within the patent; and from my observation of the operation of the two machines, in the light of the evidence, I am



quite satisfied that the substitute means employed in defendant's device is no more than such a change as might readily have been suggested to the mind of any mechanic skilled in the art, with plaintiff's device before him, and that it in no material way effects a change in the principle or mode of operation found in plaintiff's combination."

While it is not a matter of record, we believe that counsel for appellee cannot fairly object to our recording in this brief, certain of his acts and his attitude, concerning appellant in this case, prior to the retainer of said counsel by the appellee on this appeal. Counsel for appellee took a fee from appellant for consultation concerning the patent in suit, and during the argument of this case before the lower Court, espoused plaintiff's cause and went to the extent of offering his advice and suggestions to plaintiff, in a certain conference in the office of counsel for appellant, and in his presence and in the presence of appellant, which lasted for over an hour, and in the course of that conference counsel for appellee volunteered to draft a definition of a combination claim which would fit the facts and circumstances and conditions of the present suit and applying the claims therein to defendant's structures. This definition was written out in Mr. Lyon's own handwriting, was preserved by appellant, and is copied in heavy faced type verbatim on page 21 of our opening brief.

We do not know why Mr. Lyon forced these gratuities upon appellant, or what were his ulti-

mate motives, but we adopted counsel's said combination-claim-definition; we believe it a good one and we are at a loss to understand how counsel, if he were then sincere and acting in good faith and reflecting patent law as he did believe it, could now take such a diametrically opposed view of the proper interpretation of the broad claims of the patent in suit. If he then thought that the connective means, as for instance the means for inversely operating the water gate and bypass valve of claims 6, 7 and 8, could properly be represented in defendant's structure by "any substitute which can perform the same office or duty," it is hard for us to believe that he doesn't believe so now.

### STRIKING ERRORS, MISREPRESENTATIONS, UNTRUTHS AND DISTORTIONS IN APPELLEE'S BRIEF.

Where do the "proofs conclusively show" that appellant bought the patent in suit as a speculation? (See page 14.)

On page 15 counsel distorts the record at (R. 2076, Q. 483). The testimony is, as to present day commercial manufacture, and says nothing about use.

On page 16, counsel refers to what he calls Lyndon's mere dream. If he means Lyndon's inventive inspiration, all we can say is that the record shows that the world is enjoying the fruits of it. For counsel boldly to assert that the Lyndon "device" is inoperative, flies in the face of the testimony of his

own witnesses, as well as appellant's and is a desperate attempt to destroy the Lyndon grant in the face of a record overwhelmingly proving the practicability and indispensability of the novel and broad Lyndon combinations, in governing electro-mechanical water wheels.

It is shown in the deposition of Lyndon that his invention as included in claims 3 and 4 *was* embodied in the water wheel governors installed by him in Austin, Texas (R. 1947, Q. 233, to R. 1954; R. 1819-2075, Q. 481; R. 2085, Q. 499). Counsel suppresses and, in fact, disputes this evidence in the middle of page 20 of his brief. Lyndon testifies (R. 2077, Q. 485) that he knew of no governor made at the present time which does not have a returning device to prevent the governor from overrunning.

By the very weight of the record counsel is forced to admit at the bottom of page 20 and top of page 21 that the various parts including electrical devices by which water wheel gate, bypass valve, returning device, etc., *are set into motion*, are reasonably to be accepted as operative. In this he agrees with the consensus of opinion and preponderance of the testimony of all the experts in this case, and his only concern is lest some obscure and hypothetical internal trouble arise which will militate against the action of the governor to produce the results set forth in the patent.

Counsel then proceeds to indulge in a spasm of apprehension lest something go awry in some department of the mechanism shown in the Lyndon patent drawings, *in spite of the admission he has*

*made that these various parts will perform in the manner set forth.* He fears that something would go wrong with the controller and particularly with the clutch discs 22 and 23 and the rod 25 and link 25a, so that governing might be interrupted before it got well under way. The testimony shows that these clutch discs are designed to slip. Professor Durand admits that. (R. 2835.) This being so, the action of the returning device, by progressive engagements and slips of these clutch members continues until the energy in the solenoid 33 is so reduced because of the progressive accomplishment of the governing action, that the returning device terminates the governing action before the governor has overrun.

Professor Durand says in his answer (X-Q. 109, R. 2829) that the Lyndon device "is operative entirely independent of human intervention, \* \* \*."

Counsel wilfully distorts the record and the patent itself when he would make it appear that the returning device is limited to the rod 25 alone. He does this on page 85 of his brief by quoting only from one part of the patent. Want of fairness and frankness on his part would conceal from Your Honors the complete facts recited fully on page three of the patent in suit, lines 116 et seq., to-wit:

"The rod 25, discs 22 and 23, and the controlling clutch-magnet 32, constitute a returning device for preventing the governor from over-running—that is, moving the water-wheel gate a greater distance than is actually necessary for proper regulations, \* \* \*"



This is but a specimen of counsel's attempts to obstruct the path through this court of a meritorious and giant invention by strewing in its way the mere dust of misrepresentation and quibble over division and sub-division of details of the main groups of features constituting elements of the broad claims of the patent. Whether this or that portion of the Lyndon patent disclosure or defendant's devices comes entirely within one group of elements, or bridges that group over into another group, is entirely immaterial, and it is not to be wondered at that frank and independent witnesses of the standing and character of appellant and Prof. Cory should disagree as to the exact territory in the structure blanketed by the broad terms of the broad claims of the patent.

We find another stretching of the truth by counsel at the bottom of page 32 and top of page 33. It is found that Henry testified consistently, namely that contracts were made and broken under certain conditions at *substantially* the same time, and subsequently testified that these things *might* take place in sequence under certain adjusted conditions. It all shows how well Lyndon provided for variations in the relations of his detail parts so that a flexibility of adaptation of the governor was provided. The suggestion of sequence of energization is clearly indicated in the words "if properly adjusted" lines 77-78, page 4 of the patent. Counsel's contention that re-invention is necessary to permit a movement of the main gate without a movement of the bypass valve is ridiculous, in view of the number of ways and the ease with which the adjustments referred to by Lyndon may be readily accomplished.

At the bottom of page 33 counsel certainly flies in the face of a strong record to the contrary when he says, "Complainant's only answer to defendant's contention that the Lyndon device is inoperative is the production of a model which ignores the question completely, because," Counsel then attempts to prove the model inoperative and thereby the Lyndon invention inoperative, although he says that the model shows absolutely nothing "that defendant has not tacitly admitted." (Page 34.) We have seen that counsel has admitted that the parts of the Lyndon device pictured in the drawings of the patent are operative among themselves. And we find that counsel's own expert witness, Prof. Durand of Stanford University, fully agrees with appellant at R. 2803, 2804, A. 45; 2805 and 2808, in his description of the Lyndon model and its operation (as see R. 2496 to 2503) excepting that he disagrees with or cannot adopt appellant's conclusions in some respects because the Lyndon model is not connected up with a complete hydraulic power plant, which means penstock, water supply from the mountains, spillway, transmission line, commercial load with all its different factors, switchboard and so forth, *none of which are part of the governor which is the subject of the patent in suit.* Prof. Durand's attitude on this is clearly shown at R. 2857 and 2858. We must indeed apologize for not being able to set up in a courtroom all of these elements of power consuming machinery, rapidly flowing torrents of water, long transmission lines, dangerous switchboards, and all the other paraphernalia of an electro-mechanical power plant such

as found on the Pacific watershed. On the practical side is the fact that the Lyndon invention is, and for ten years has been, operatively employed in performing in accordance with the teachings of the broad Lyndon invention and in doing just what the Honorable Trial Judge admits in his opinion, namely, "actually producing the useful result claimed for the Lyndon patent." (R. 68.)

Counsel (page 35) attempts to make it appear that there are different modes of operation in the Lyndon invention and defendant's devices. At no place in appellee's brief is there pointed out, nor can there be pointed out, any distinction between the operation of inversely moving the water-gate and bypass valve in the patent and in defendant's device, nor between returning the bypass valve to normal position after use in the patent or in defendant's structure, nor in the action of a returning device as such in both cases to prevent the governor overrunning. *These things occur in both instances, upon the same principle and pursuant to the same general mode of operation.* It matters not that certain well known parts are employed in one instance in substitution for other certain well known parts in the other instance, and that these different devices execute somewhat different individual movements in certain cases. If these differences are sufficient to draw a line between the big accomplishment of Lyndon and the studied imitation of defendant, there can be no such thing as piracy in patent litigation. This same erroneous view of the

law was entertained by counsel in *Union Tool Company v. Wilson*, 249 F. 736, *supra*.

Counsel's failure to distinguish between the breadth of a claim having an element for "means" and the narrowness of a claim for specific parts claimed specifically in combination, led him into grievous error in the long litigation decided by Your Honors in *Wilson and Willard Manufacturing Company v. Union Tool Company*, 249 F. 729, *Advance Sheets Federal Reporter* of July 18, 1918.

Counsel baldly distorts the facts (middle page 37) when he calls the Lyndon governor an "electro-mechanical" governor. In no place in the patent is the governor so described. The governor is described in the title, which is a mere designation of the art to which the invention belongs, as an electro-mechanical *water-wheel* governor, or a governor to be used in the art of electro-mechanical water wheels, namely, a governor for water wheels for *mechanically* driving *electrical* generators.

The manner in which counsel indulges in vagaries and twists and turns of statement and fact are displayed on pages 126 and 127, where he would make it appear that Mr. Lyndon's invention was for an *electro magnetic* water wheel governor. Palpably this is an attempt to limit the invention, not to what the title really implies, but to the use of incidental electro-magnets which Lyndon happened to disclose as *one means only of setting into operation the main elements of his device*.

The governor is nowhere specified as an electro-



mechanical governor. Wherever the words "electro-mechanical" are used, they are used in combination with the water wheel and where the governor is specified separately from the water wheel, it is invariably spoken of as a governor; not an electro-mechanical governor. Counsel says that "it was necessary for Lyndon to so limit himself in view of the prior art." This is not true nor has he so limited himself; the claims do not read for an electro-mechanical water wheel governor. As a basis for the contention of counsel, the title should have read "Electro-mechanical governor for water wheels" and counsel is desirous of having Your Honors reconstruct the title of this invention in this manner. The title is no part of the claim, nor is it to limit the claim.

The claims are the scope and measure of the grant to Lyndon and it was and is Lyndon's intention that this governor find its most useful application in the field of electro-mechanical water wheels. The defendant in this case is employing the Lyndon invention in the electro-mechanical water wheel plants on its aqueduct. All of the other numerous water wheel plants mentioned in the testimony as employing the Lyndon governor, by the several experts called by both sides are plants correctly described as electro-mechanical water wheel plants. Constant speed is of the greatest importance in the mechanical operation of electrical generators by water wheels, hence the electro-mechanical water wheel art. See the testimony of defendant's expert witness Cobb (R. 705, A. 224).

Counsel (page 41) attempts to divert the court's attention from the clear and full purport of Section 4888, U. S. R. S. by making it appear that all Lyndon invented was a "part." Admittedly, Lyndon invented the "combination" or "combinations" of his claims, and his claims are not for "parts," but for broad agroupments of features co-ordinated, because of their *general characteristics, to produce certain results in a certain characteristic manner*. He did not invent "part" of a governor, but he invented "combinations" in governors for electro-mechanical water wheels.

Counsel attempts (pages 43 to 45) to apply the rules relating to contracts involving the kingdom or state, so as to create an adverse impression as to the liberality to be accorded to the patentee in the interpretation of this patent. Not only is the United States not a Kingdom, but the courts have repeatedly held that any doubt as to the position of the inventor in his relation to the public is to be resolved in his favor. In our opening brief (page 60), we quote cases applicable to the present situation. He who has made an invention and paid for patent for it is entitled to every modicum of real right in the premises. In the United States, the people contract, through the Federal Government with themselves, not with an over-lord on principles of paternalism, and the grant is not prayed for at the feet of a king.

Even if the title given to the invention in the patent be supposed, by doing violence to construction, to relate in any manner to the specific forms shown in the drawings and any electrical features thereof, it

would not limit the broad claims to such electrical characteristics, any more than the claim for a car body would be limited to a trolley car so as to exclude a steam car, even if a trolley were shown in the drawing of the patent as conventional means for providing motive power for the car.

Counsel does violence (page 45) to the record in stating that Lyndon did not himself bring suit under his patent. The record shows (R. 2584) that Lyndon brought suit before the year 1908 against a large infringer through a New York attorney, now deceased, for infringement of his patent, but Lyndon did not have means to carry on the suit, and other reasons of policy required its discontinuation.

His Honor, Judge Trippet, has found (R. 68) that "the defendant's device has been highly successful from the time of its installation, and since then he has been actually producing the useful result claimed for the Lyndon patent." Lyndon states very clearly on page 4 of his specifications, line 49: "The object of this compensating device is to take care of the inertia effect of the column of water in the feed pipe." And on lines 60 to 65 he clearly shows his understanding of the effect of gravity upon the flow of the water in the pipe line.

It is, therefore, clear that the results to be obtained with the Lyndon governor are the taking care of the inertia effect of the column of water in the feed pipe. To successfully govern the plant we must move the water gate quickly; if the water gate be moved quickly, the inertia effect of the water column in the pipe would be damaging unless Lyndon's com-

pensation means were employed in combination with said gate movement. (See specification page 4, lines 88 to 98.) The result sought to be attained by Lyndon is, therefore, the regulation of the speed of the water wheel by controlling the water flow to the water wheel and, at the same time, taking care of the inertia effect in the water column or pipe line. Mr. Scattergood testifying (R. 163, A. 26) says that "the result" (of the operation of the bypass or auxiliary relief nozzle of the defendant) "is to prevent dangerous rise of pressure which might endanger the penstock line, \* \* \* \*." Defendant's witness McAfee supports this same evidence (R. 1568, 1569). The results attained by the defendant's structure is not water economy (see McAfee R. 1591). The results attained in the defendant's structure and that of the Lyndon patent are the same, namely, that the bypass or auxiliary relief nozzle opens and permits the escape of water to "*prevent*" (not relieve) excess pressure to which the pipe line and water column would be subjected on any occasion where governing takes place. And this same identical condition exists, and result is attained, by the Lyndon structure. During the period of bypass or auxiliary nozzle opening, there is an excess flow, or waste, of water through the bypass in both defendant's structure and in Lyndon's; and after governing has been accomplished, the excess flow of water is reduced to a minimum, by the slow return of the bypass valve. The actual governing of the water wheel in both the Lyndon device and that of defendant is accomplished *mainly* by the main gate, and the inertia effects are



taken care of in the bypass. (See Lyndon's specifications, page 4, lines 96 to 99.)

We also wish to call Your Honors' particular attention to the recent decision in the United States Fire Escape Counterbalance Co. v. Jos. Halstead Co., Northern District of Illinois, opinion by District Judge Sanborn (246 Fed. R. page 947). The second Syllabus in that case is as follows:

"A patentee is not limited by a particular description of his device in the patent, where it is expressly stated to be the preferred form of construction."

We also quote the following matter, beginning at the bottom of page 949:

"It is plain that the purpose of the inventor is to increase the weight of one section after the other, so as to keep the device in *either* one of the two positions. He prefers the ball and cylinder form, but shows no purpose to disclaim any other form in which the invention may be embodied, because he expressly says that the one described is the preferred form. *The law gives him the advantage, even if he does not claim it.* Winans v. Denmead, 15 How. 330, 14 L. Ed. 717, approved in Western El. Co. v. La Rue, 139 U. S. 601, 11 Sup. Ct. 670, 35 L. Ed. 294; United States v. Societe Anonyme, 224 U. S. 309, 32 Sup. Ct. 479, 56 L. Ed. 778. This preferred form is not essential to the operation of the ladder, as shown by the defendant's form, Werner v. King, 96 U. S. 218, 24 L. Ed. 613. Unless it can be seen that the ball and cylinder form constitutes the very gist and fundamental theory of the invention, a claim for 'means comprising an adjustable counterbalance,' as in claim 2, is not too broad.

State Bank of Chicago v. Hillman, 180 Fed. 732, 104 C. C. A. 98; Burroughs Adding Machine Co. v. Felt & Tarrant Mfg. Co., 243 Fed. 869, C. C. A."

This decision is closely in sympathy with the decision of His Honor, Judge Van Fleet, in 227 Fed., R. 449, *supra*. It is likewise in sympathy with the leading authority, the Paper Bag case, 210 U. S., with Ries v. Barth, 136 Fed., and with Davis Sewing Machine Co. v. New Departure Mfg. Co., 217 Fed., all discussed in our opening brief, particularly with respect to the proper interpretation of the word "means."

Clearly, there is a distinction between a claim for a machine *provided with power transmission means*, and a claim for a machine driven by 10 feet of shaft, having a 12 inch pulley and an 8 inch belt and mounted in journals each having two oil cups for lubrication.

Counsel for appellee would have it that no skill of the patent attorney and no breadth of accomplishment in invention by the patentee could create any recognized distinction in scope and breadth between claims such as 3, 4, 6, 7 and 8, of the patent in suit and claims 1, 2, 5, and 9 thereof. This is the same sort of error counsel made in Wilson & Willard Mfg. Co. v. Union Tool Co., 249 Fed. 729, *supra*.

On page 50, we find a direct misquotation from the authority cited, Wilke v. Ostrum, and one which alters the meaning of the authority. Counsel has substituted the word "this" for the word "his" in

the fifth line of the quoted matter, which makes it appear that the defendant's machine may be intended to be spoken of instead of the plaintiff's. Furthermore, the last two lines of the quoted matter should be revised to read as follows: "was covered by the machine described in his specification and claimed in his application." The change by counsel eliminates any reference to the application as filed. Was it for the purpose of distracting this Court's attention from the fact that Lyndon's broad claims were allowed substantially as presented in the original application?

The "extraordinary occasions," mentioned so frequently by counsel for appellee (page 51), in which the auxiliary nozzle is used as a safety valve, are the occasions when the governor moves the main gate with sufficient rapidity to otherwise cause an inertia effect requiring action of the bypass, or "safety valve," which is then actuated by the governing means, and as such, employs the Lyndon invention.

The principle of operation of the Lyndon device is that: based upon the necessity of quickly moving the main gate to control the flow of water to and, therefore, the speed of the water wheel, it is necessary to discharge water which would otherwise come to the water wheel; through a separate or auxiliary bypass, and this bypass operates inversely to the operation of the main gate.

This is the primary principle upon which the Lyndon device operates and the defendant's device operates upon the same identical prin-

ciple. We have seen above that it accomplishes the same results. The means for accomplishing these results are the same in both devices—a main gate; a bypass and a valve controlling the bypass and interconnecting means operating them inversely, the one with respect to the other, under the control of the speed sensitive element. The record is pointed out fully in our opening brief (pages 51 to 69), and the testimony of Prof. Cory (page 279), of Scattergood at Ans. 25, R. 162; defendant's expert Berry, R. 1040, Ans. 177; Scattergood, R. 166, Ans. 32 to 39; 163, Ans. 26. (See also R. 206 to 225 inclusive.)

The bypass is also to prevent an increased spouting velocity on the closing movement of the water wheel gate, and for the reason set forth in lines 1 to 35, page 1 of the patent in suit. This is proven in the defendant's devices by the testimony of Scattergood, appellee's witness (see pages 37 and 38 of our opening brief). Manifestly, defendant uses the bypass valves for all of the benefits accompanying governing by the Lyndon invention. Otherwise, why does defendant not discard it and to that extent avoid infringement?

Counsel insists (page 52) that the "bypass valve must have a movement inverse to that of the main nozzle in *both* directions at all times." This is a deliberate misstatement of facts as Lyndon claims that it must have an inverse movement in *either* direction and at no point did he use the words "both directions at all times."

Counsel's contention (page 53) that appellant's expert Prof. Cory admits that there is no true



equivalence; (referring to R. 443 and 444) is a direct misstatement of facts. Cory finds the mechanical equivalent of the result and operation but not the actual *physical* equivalent of the several parts, and his testimony here referred to is directed exclusively to elements of the claims 1 and 2 of the Lyndon patent, which are specific claims involving electrical and magnetic features in the specific governor structure of the drawings.

Counsel for appellee indulges in a large mass of verbiage as to the exact limit to which each of a large number of detail parts are to extend and the exact limits of the elements in the claims.

As an example of the utter weakness of such contentions note that he insists that lever 26 distinctly and alone is to be construed as the Lyndon controller. Page 1, line 66 of the Lyndon specification says "Fig. 6 illustrates in detail a *part* of my controlling device." By referring to Fig. 6, it is seen that the controlling device constitutes a large portion of the mechanism of the governor and includes with the lever 26 a great many other parts. We believe that in the structure of patent claims, it will be found that an element, almost invariably, consists of a number of parts associated together in some special and useful relationship and that these elements again are associated in some special relationship to form the completed combination. Such elements, for example, are the Lyndon controller; the main water wheel gate; the bypass and the connective means of the Lyndon claims. The mere fact that the elements are connected together in operative

association, compels the conclusion that no line of demarcation can be drawn between them. The best that can be done in such a case is to draw a line across the connection between the elements, and it is a matter of opinion largely as to just where such line would be drawn between two connecting elements. The description of the device covered by any claim must be presumed to go to the full extent of covering the entire structure—that is, the sum of the elements of every claim must equal the complete structure covered by said claim.

As an instance of the futility of counsel's attempt to make something out of trivial inconsistencies, as to details of the Lyndon patent disclosure, we find him admitting in the middle of page 57, that the means for operating the water gate in either direction is the reversing gear and shafts 12 and 20 of the Lyndon patent. At the bottom of page 58, he takes issue with his own contentions in this respect.

As to counsel's reiterated citation of Judge Baker's decision in *Eagle Sanitary & Cremation Co. v. City of Ellwood*, 73 Fed. 484, we have already called attention to the later authority by the same able Judge in *Reis v. Barth*, 136 Fed., *supra*. This case merits careful reading.

Manifestly, defendant uses every element of the broad claims of the patent and it is immaterial at just what parts of the groups of elements of the patent in suit one group leaves off and another begins. For instance, the reversing gear 11 is on the same shaft 12, as the clutch disc 22 of the returning device. Is it proper to arbitrarily put the shaft 12

in either the returning device or the reversing clutch gear? Witnesses like Henry and Cory, mechanical experts, under captious cross examination, may honestly and genuinely vary in their testimony as to such things, without either of them being really wrong. No real conflict is produced and all the real groups of elements of the Lyndon broad claims are represented in the defendant's structures.

Our opening brief clearly points out by reference letters the elements of the broad claims in their location in the infringing device, on pages 55 to 57 inclusive.

Counsel cites the well-known "Nose of Wax" decision (page 73). Why, if counsel object so to distorting claims, should he attempt to distort the plain comprehensive meaning of the broad claims of the patent in suit?

Counsel's effort to show the lack of equivalence between the dynamo shown in the Lyndon specific structure and defendant's fly balls is an example of the efforts which he is making to mislead and to cloud the issue. The fly ball element with its associated parts in the defendant's structures is the speed sensitive element, and as such it is equivalent to the speed sensitive feature of the dynamo of the Lyndon specific device. The oil pump that supplies pressure fluid is driven from the same source of power in the defendant's device as is the dynamo in the Lyndon structure, and the pressure fluid is the equivalent of the electric fluid from the Lyndon dynamo; and both are for actuating the parts of the

respective mechanisms. In Lyndon we have the electrical circuits and the energy which they carry for moving the governor parts. In defendant's structures we have the pipes and oil circuits and the pressure oil which they carry for moving the governor parts. Electrical fluid in one instance and pressure fluid in the other. These fluid energy circuits of defendant are shown in the diagram of our opening brief, page 51, and the numbers attached to the circuits correspond with the numbers shown on the Lyndon circuits of the patent. The fluid pressure pump to the right of the diagram and the speed sensitive element, namely, the fly balls, correspond with the dynamo 8 of the Lyndon patent and the analogy is perfect, fluid energy derived from the water wheel shaft in both instances being used to shift the parts. The division of an element by defendant does not avoid infringement. A speed sensitive device in both instances sets into operation the parts to release the fluid energy through the proper channels. The principles of operation could not be more identical. The controller of the Lyndon device which is set into operation by the speed sensitive mechanism, directs the flow of fluid energy in the proper channels to accomplish the desired movements. The line to line valve of the defendant's structure, is set into operation by the speed sensitive device of defendant and then directs the flow of fluid energy through the proper channels to cause the proper movements.

The movements caused are the shifting of the water wheel gate and the shifting of the bypass



valve (claims 6 and 7). This is the period of governing action of the water gate. (See Cobb, Ans. 817-820, R. 878.)

Lyndon employs weights and dash pots for the slow return movement of the bypass valve after governing; the defendant employs springs and a dash pot to effect the slow return of the bypass valve, after governing. In both cases this action takes place after the governing movement of the water gate operating means. (Claim 7.)

In our opening brief we have shown a diagram facing page 29 illustrating the principles of operation of the Lyndon invention and the infringing structures. In Lyndon we have a device for returning the controller to inoperative position after it has been acted upon by the speed sensitive element and before the governing has overrun. In the defendant's devices the returning element is acted upon by the speed sensitive element to return the controller to inoperative position before the governing has overrun. The principles of operation of the two structures are identical. The elements that we have here described are clearly set forth in claims 3 and 4. (See Cobb, Ans. 793, R. 873.)

The speed sensitive element in both structures is a rotating mass, being driven, in said rotation, from the water wheel shaft. The controlling element has a reciprocating part actuated by the speed sensitive element.

The power means for shifting the gates in each of the devices obtains its energy from the water wheel shaft, electrical energy in Lyndon's, and oil pres-

sure or fluid energy in defendant's devices from the pump driven from the water wheel shaft. The energy in each case causes the movement of the gate valve either to open or to close, and also said mechanism through said energy, causes an inverse movement of the bypass valve through the connective means.

The main water wheel gate and the bypass in the Lyndon device, as well as in the infringing structures operate to open or close, or close or open, an outlet for water. The main water gate directs the proper quantity of water to flow onto the water wheel to generate electro-mechanical power and the bypass directs the proper water to discharge independently of the water wheel, to prevent inertia effects. The returning mechanism of Lyndon acts to return the controller to an inoperative position after its disturbance by the speed sensitive mechanism. The returning device of defendant acts to return the controller (line to line valve) to inoperative position after its disturbance by the speed sensitive or fly ball element. The action of this returning element cannot be described as elastic, in that elasticity does not involve the lapse in time. The returning element in both devices, Lyndon and the defendant, involve the time element—that is, the returning action on the controller element must *lag* slightly behind the original displacement of the controller; and after the lapse of an appreciable time, the controller is to be returned to an inoperative position. This lapse of time in the returning element is accomplished by Lyndon in the retarding

action (slipping period) of the clutch (see Prof. Durand, R. 2835), and in defendant's devices in the retarding action of the oil dash pots of the Lombard devices. It is believed that this is a perfect example of mechanical equivalence. It will be seen that we have shown above the identity of result, and that this is accomplished by substantially the same means in substantially the same way.

The record does not support appellee's contention (page 80) that Prof. Cory asserts that there is no equivalent of the controller in the infringing device. On the contrary, the reference shows that Prof. Cory did not find the *exact* equivalent of the entire circuit controller in a small part of one of the elements of defendant's devices, but he very clearly did find the mechanical equivalent in the defendant's device of all the elements in the Lyndon structure. (See R. 461-529, Q. 522; R. 2406, Q. 875.)

The degree to which appellant's counsel is willing to go in order to construct law to meet his needs, is clearly illustrated in his statement at the top of page 97, reading: "The specific means illustrated in the Lyndon drawings and described in his specification must be read into his claims in order to avoid the necessity of construing them as functional and void." If this be true, Lyndon would be entitled to claim but one single construction, and that in one claim, and it would be necessary for him under the interpretation of counsel to describe every single part in detail and its association with all other parts. If such contention be true there is not a valid claim

for a machine issued from the Patent Office to any inventor. The object of allowing a patentee more than one claim is, on the face of it, for the purpose of bringing within his invention and the patent, variations in structure, which accomplish the result by means equivalent to those disclosed by the inventor. See the authority at page 63 of our opening brief: "That each claim of a patent is a separate invention." The intent of the contract which the government makes with the inventor covers the length and breadth of his addition to the art as covered by his claim. We contend that the Lyndon invention is entitled to the length and breadth of the claims, is unanticipated and valid, and as proved by the evidence in this case, has gone into extensive use.

Counsel's allegation of impracticability of the Lyndon structure is presumably based upon the testimony of Cobb and Berry. We can find no other testimony in the record which could support any such assumption, and Cobb and Berry, it is to be noted, might readily consider any governing mechanism which they had not proved out in operation as impracticable. Their experience with the Bakersfield device was so disastrous as to *fix* "impracticability" in their minds. They are not equal to rising to the heights of the Lyndon invention. They knew what the art demanded. They tried to devise such a governor but they were not equal to the occasion.

On page 99, counsel contends that claimant has admitted that there is no bypass valve or its equiva-



lent in the infringing devices, by insisting that the plug cock valve of Bakersfield is the equivalent of Lyndon's Butterfly valve. Had Cobb or Berry substituted the Lyndon form of valve in the Bakersfield installation, they might have had a successful bypass valve. It was an old type of valve, but it had not been previously used in combination with a water gate actuated in a governor for bypassing water. Lyndon invented this combination.

Counsel (middle of page 79) states that Mr. Lyndon "nowhere in his specification" refers to solenoid 33 as simply the controller. It is manifestly an essential part of the controller and in lines 131 and 132, page 3 of the patent in suit, Mr. Lyndon does refer to it as the controlling solenoid 33 (see also Lyndon's patent, Fig. 6). Isn't it plain that this is an essential part of the controller and that the lever 26 merely operates conjointly with it, both parts entering into the controller, and as an element of the governor?

We recommend to Your Honors' reading Syl. 2 of the case cited at the top of page 81. This case is not in point for appellee, as the invention was a limited one, and is limited to certain specific structures and elements without any broad claims like those in the patent in suit. We have been unable to find the matter of the second paragraph on page 81 in either the case referred to above such matter or below such matter.

Again at the top of page 83 comes the misleading statement that the lever 26 is solely and completely

the "controller" of the claims, ignoring the controlling solenoid 33. All of these hair-splittings are immaterial, inasmuch as we have seen that the same groups of elements exist in both the Lyndon broad claims and the defendant's structures, with the same functions and giving the same results, as found in the last instance by Judge Trippet. If counsel wishes to truly present the question of the returning device, he should include reference to the testimony of Prof. Cory (page 2474, Q. 100, and Cobb, page 462).

Although counsel insists that infringement is not a mere matter of words, when we find parts in defendant's device to which the language of complainant's claims applies, both as to the kinds of parts and their functions and the results obtained, how can infringement fail to be found? *Take Lyndon's combinations out of defendant's apparatus, and defendant's apparatus will remain a mere framework with no working parts. The Lyndon invention, as expressed in combination claims 3, 4, 6, 7 and 8, is the heart and substance and entirety of defendant's structures.* In his extremity counsel's argument at the top of page 97 well nigh, if not entirely, denies appellant any application of the doctrine of equivalence. He would emasculate the real invention by reducing the board combinations to matters of solenoids, shafts, clutches, discs and the like, and break the contract between the United States and the patentee when claims 3, 4, 6, 7 and 8 were allowed to him.

Counsel's wretched illogic at the top of page 99,

would imply that there was a plug cock valve in defendant's device. There is no such thing. He then follows this up by attempting to reorganize the Bakersfield abandoned experiment, against the inhibitions of this Court in *Stebler v. Riverside Heights, et al.*, 205 Fed. 735. Counsel's argument bottom of page 99, is answered by pointing out that merely connective means are to be modified in connection with the type of valves employed. This does not avoid infringement, as we have seen.

Counsel implies at the top of page 100 that Lyndon shows the plug cock valve. There is no such valve in Lyndon, as counsel well knows. The needle valve is a balanced valve as the record shows. We deal elsewhere with this question, of the Bakersfield failure, and the difference in the types of valves between Bakersfield and Lyndon.

The testimony of the witnesses of defendant in this case as to use of the Bakersfield device does not measure up to the kind of proof required by the *Barbed Wire Patent* case, 143 U. S., or as required by Your Honors in *Parker v. Stebler*, 177 Fed. R.

Clearly, the Bakersfield device, even if it were operative could have no relation in anticipation to claims 1, 2, 3, 4, 5, 7, 8 and 9 of the patent in suit, and defendant's use at least claims 3, 4, 6, 7 and 8.

The authorities of defendant (page 116) are all for us. We do not claim any "means" independently of other features, but only as connective parts of broad combinations of elements. As stated in our opening brief a claim solely for "means" for inversely operating valves, apart from the valves

themselves, would be merely a claim for a function and would not express a complete combination.

Counsel clearly resorts to untruth when he says (page 117), there is no means in defendant's device for returning the bypass valves to normal position.

Our opening brief points out the combination entities which are clearly to be construed within the principles put on paper by defendant's counsel and appearing in large type on page 21 of our opening brief.

We think we have demonstrated in the record that every effective governor for water wheels used in generating electricity uses one or more of the combinations of the Lyndon invention. This in reply to the observations on page 119.

Replying to the matter at the bottom of page 120 and page 121, it cannot be seen how counsel can make the assertions he does as to the means for returning defendant's bypass valve to normal or usual position. It only remains to be said that an *impulse* is given *at all times* to the bypass valve when the water gate valve is moved, and if the bypass valve is so set it will move responsive to this impulse and it will of necessity slowly return to usual position, as it does in the Lyndon invention.

Counsel makes a crass and crude observation on page 122, in parenthesis, in the middle of the page, which we are sure will be beneath the notice of this Court. This comes as the climax of untruthful representation as to mechanics and effects produced, and is an attempt to drive home a bent nail with a headless hammer.



At the bottom of page 123, counsel asserts the rule which a defendant must follow in proving *prior invention*. It is *not* the rule in carrying back the date of the invention of a patent in suit to prove the incipency of such invention. The latter rule is the one complied with by appellant in this case in taking the testimony of Meyer, Reid, the younger Lyndon, the patentee Lyndon, and others as to which rule we have quoted at length herein, from Walker on Patents.

We find nothing to support the contention on page 100 of appellee's brief that the plug cock valve of the Bakersfield device and the Lyndon patent are known as "balanced valves," while the needle of defendant's device does not come within the description of a balanced valve. Cobb may have called the Bakersfield type of valve a balanced valve, but his subsequent experience with it and his report after its attempted operation proves conclusively that he was in error and that the valve was not what is called a balanced valve. (See the testimony of Cory, Dearth, Van Norden, Wilson, Henry, Cobb and Berry. See opening brief, pages 31 and 32.)

In the last paragraph on page 131, appellee's brief, he attempts to draw a sharp distinction between the clutch gear, etc., of Lyndon and the hydraulic cylinder of defendant's device. If the word "revolving" be cancelled from this paragraph, the analogy looms up perfectly between Lyndon and the defendant; a shaft to transmit motion or

perform all the functions necessary in this case may move endwise or only partly turn.

On page 150, appellee says, the tendency of the springs indicated by the letter "K" of complainant's chart is to "always close the auxiliary needle, *and there is nothing to prevent it from doing this.*" The oil dash pot on the defendant's bypass needle shaft retards this closing movement, insuring the *slow* return claimed by Lyndon, and *introducing the time element which he has removed from the water gate and taken care of in the bypass.* During this slow closure of the auxiliary needle, after governing movement, there is a wastage of water and this wastage of water is to prevent the inertia effect in the pipe line—that is the object and function of the same parts in the Lyndon structure. Counsel contends that defendant's springs do not perform the same function as the Lyndon weights. Defendant's springs certainly return the bypass valve after a governing movement. Lyndon's weights certainly return the bypass valve after a governing movement. A flight of marvelous fancy is evidenced by counsel (page 152) commencing, "Defendant does not use such a bypass and does not regard the natural law forming the basis of Lyndon's alleged invention, for the reason that another natural law has neutralized the effect of the first, namely: the law of gravitation operating through a steep pipe line, increasing the velocity of the water has made it possible for defendant to disregard Lyndon's theory." That Lyndon fully understood this law of gravitation and its effect is clearly shown on

page 4 of his specification, lines 63 and 96 to 98. The entire reason for the Lyndon bypass valve is to introduce the time element necessary while gravity acts upon the column of water, and an adjustment to changed conditions takes place.

The law requires that a patentee set forth his invention in "claims." Claims are made up of words, not things and we are at a loss to understand how claims can be expressed other than in words, as counsel would indicate is necessary on the bottom of page 153.

Counsel would appear to believe that it is necessary for an inventor to describe in a claim, in the utmost detail, even more completely than in the average specifications, the device which would be covered, and would solely be covered, in the patent that might issue. This would entirely efface any question of protecting any breadth of invention and would limit the patentee to the specific structure—a limitation equal to or greater than that imposed in a design patent, which is manifestly at variance with the law, equity and common sense and is an absurdity in direct conflict with the ruling laid down in the 6th Circuit in *National Tube Co. v. Mark, et al.*, 216 Fed. 507, by the Circuit Court of Appeals, (Syl.):

"Where a patent contains both a broad and a narrow claim the Court cannot construe into it a limitation not therein expressed, but which is expressed in the narrower claim and by which alone, one is distinguished from the other."

Counsel's attitude regarding the matter of proof

of incipieny conclusively proves that counsel does not know the law or wilfully misrepresents the law on this question. The testimony of our witnesses in this behalf is that of high grade men, it rings true and is conclusive proof. There is no basis in the record for the attack which counsel makes on these men (pages 124-125).

In connection with counsel's citation (page 126), there is to be borne in mind the decision of this Court in the companion case of *Union Tool Co. v. Wilson*, 249 Fed., R. 736.

Counsel makes a bald utterance of untruth at the bottom of page 127, when he says the litigation between appellant and the Pelton Water Wheel Co. involved anything else than the Lyndon patent. That litigation was a suit brought in the Northern District of California for infringement of the Lyndon patent in suit here and for nothing else.

Judge Trippet himself has found sufficient equivalence to support a finding of infringement, (R. 72), and the leading decision of the Supreme Court cited in our opening brief (page 53), with others, destroys all of counsel's arguments for non-equivalence in the case at bar.

All through counsel's brief there is evinced a fear to deal with the big issues of this case. Counsel never comes out in the open to meet these issues, we see him flit from cover to cover, throwing dust as he dodges, attempting to becloud rather than enlighten the issues. His strange and unfounded final arguments (page 147), and his lapsing again and



again into the errors he indulged in in *Parker v. Automatic Machine Co.*, 227 Fed., *supra*, mark his efforts to obtain an affirmance of the decree of the lower court, as a mere side-show set up remote from the main tent. Appellee clearly uses the *same groups of the same kinds of elements, operating in the same kind of manner to produce precisely the same results, as disclosed and claimed in the Lyndon patent*. It requires no torturing of any of the doctrines to come to a finding of infringement in this case. The very findings of the trial judge go far enough to fully warrant the ultimate finding of infringement in this case. As we have observed, the Honorable Trial Judge was evidently withheld from such finding by failure to fully comprehend the fact that Lyndon's invention was something more than depicted in the drawing of his patent; he does not appear entirely swayed by that view, but he doubts whether the principles of the two things are the same. As he found that the results claimed for the Lyndon invention are obtained by defendant's devices, it would seem that by virtue of his further findings (pages 154-155), there could have been no possibility within law or logic of any other final finding than infringement; the patent being admittedly valid and unanticipated. *The substance of the invention has been taken*, as stated by Your Honors in *Stebler v. Riverside Heights, et al.*, 205 Fed., R. 735, *supra*. As the lower court found, in effect, equivalence among the groups of elements of the machines, how could the total machines of appellee fail to in-

fringe when they obtained the identical results of Lyndon, using the same principle of action?

These things were accomplished by groups of elements with connective parts, all claimed broadly in combinations, but not too broadly for the fundamental, pioneer and far reaching value and importance of the Lyndon invention. Evidently the trial Judge had not, at the time of this decision, grasped fully the application of the law to the interpretation of claims for broad inventions, either pioneer or quasi-pioneer. Lyndon taught the world big things and his assignee should reap the reward.

We urgently solicit that within equity and good conscience, upon the law and upon all the facts, a decree may run ordering the trial court to grant the relief prayed for in the Bill.

The facts and the law warrant reversal of the decree of the lower court.

Respectfully,

RAYMOND IVES BLAKESLEE,

Solicitor and Counsel for Appellant.

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#### ADDENDUM.

In consulting Walker on Patents on the general question of mechanical equivalence, we must bear in mind that his views on this doctrine are narrow. They were not approved by the Supreme Court in

the Paper Bag case, 210 U. S., *supra*, in which *he was counsel* for the defeated party, and this question was paramount.

We wish to call Your Honors' attention to a few slight misprisions appearing in our opening brief. The word "Loomis" in line 9, page 18, should be "Loom Co." Line 17, page 22, "or" should be "for." The semi-colon in line 13, page 25, should come out and the word "Howe" in line 15 should be "15 Howard." The words "for defendant" should appear at the end of the line 10, page 52. In line 13, page 69, "243" should be "242."

*18*  
*212*













